11190 Sunrise Valley Drive
Suite 300
Reston, VA 20191
Main: 703 709 6500
www.wspgroup.com/usa

September 9, 2013

Mr. Randall Maud, P.G.
Geologist
Pennsylvania Department of
Environmental Protection
Southeast Regional Office
2 E. Main Street
Norristown, PA 19401-4915

Re: WSP Summary of Brooks Instrument Site Activities
Hatfield, Pennsylvania

Dear Mr. Maud:

WSP USA Corp. (WSP) has provided the Pennsylvania Department of Environmental Protection (PADEP) three summary letters (January 2007, November 2007, and July 2009 - Enclosed), each describing investigations and remediations conducted at the Brooks Instrument site in Hatfield, Pennsylvania. As you are new to the project, on behalf of Emerson, WSP has prepared this letter summarizing the work conducted at the site since July 2009 in preparation for our meeting in Hatfield on September 11, 2013.

Groundwater Remediation System

Groundwater has been pumped from well MW-2 and formerly from MW-3 since 1981 to capture and treat volatile organic compounds (VOCs) in the bedrock groundwater beneath the site. Pumped water is routed to an air stripper for treatment and subsequently discharged to an onsite storm water retention pond. The discharge is regulated by a National Pollutant Discharge Elimination System (NPDES) permit. The permit requires the collection of monthly water samples from the discharge point and analysis for TCE, PCE, and pH. In addition, the permit requires quarterly groundwater samples to be collected from wells MW-1, MW-2, and MW-3 and the samples are to be analyzed for TCE and PCE. All results are submitted to the PADEP. In addition, annual groundwater monitoring reports are prepared and submitted to the PADEP summarizing the data collected throughout the year and providing an evaluation of the treatment system. In 2010, a second recovery well (designated RW-2) was installed along the southwestern boundary of the site (near MW-5S/5D) to prevent offsite migration of VOC-affected groundwater (Figure 1).

Groundwater is pumped at an average rate of approximately 7 gallons per minute from well MW-2 and 3 gallons per minute from well RW-2. Concentrations of TCE and PCE have decreased dramatically in well MW-3 throughout the 32 years of pumping of either MW-3 (2/1980-6/1998) or MW-2 (12/1997 to present). TCE concentrations were greater than 3,400 µg/l and are currently less than 375 µg/l. PCE concentrations were greater than 800 µg/l and are currently less than 50 µg/l. In addition, concentrations of TCE and PCE in well MW-5S have decreased since pumping began in RW-2 in 2010. TCE concentrations were greater than 350 µg/l and are currently less than 115 µg/l. PCE concentrations were greater than 50 µg/l and are currently less than 20 µg/l. Overall, the groundwater treatment system continues to operate as designed to reduce VOC concentrations at the site and capture groundwater to reduce the potential migration offsite.

Monitoring wells MW-9, MW-10, and MW-11 are located offsite, downgradient (Figure 1). Since 2009, TCE was not detected in these wells (previously highest concentration was 1 µg/l). PCE was detected as high as 3 µg/l in well MW-10 in 2008 but at concentrations less than 1 µg/l since that time. The most recent sampling data from June 2012 indicated no TCE in all three wells and PCE only in well MW-10 (estimated concentrations of 0.36 µg/l at the 95 foot fracture and 0.69 µg/l at the 182 foot fracture).

Soil Sampling Inside and West of Building

To determine if a source for the VOCs detected in groundwater in well MW-5S is present in soil beneath the building, a soil sampling program was conducted in July 2011.

The soil borings were designated SB-100 through SB-107 and installed inside and adjacent to the building. The borings ranged in depth from 2.7 feet to 8 feet below ground surface (bgs) and were terminated upon refusal at the bedrock interface. A total of nine soil samples and one blind duplicate sample were collected from the soil borings for VOC analysis. Headspace analysis indicated the presence of organic vapors in just one of the eight soil borings (SB-104), and analytical samples were collected from 3 feet to 4 feet bgs (i.e., the interval where the highest readings were detected) and from 7 feet to 8 feet bgs (i.e., from the bottom of the boring) at this location. One analytical soil sample was collected from the base of each of the remaining borings.

Three chlorinated VOCs were detected above the PADEP MSCs for non-residential soils in the two samples collected from SB-104, located west of the former maintenance shop area (Figure 2). Cis-1,2-dichloroethene (cis-1,2-DCE) was detected in both samples at concentrations of 22,000 micrograms per kilogram (µg/kg) (11,300 µg/kg in the duplicate) in the shallow interval and 61,300 µg/kg in the deep interval. Trichlorethene (TCE) was detected in the shallow interval at a concentration of 834 µg/kg (estimated 28 µg/kg in duplicate). Vinyl chloride was detected in both shallow and deep samples collected from SB-104 at concentrations of 1,330 µg/kg (2,780 µg/kg in duplicate) and 7,350 µg/kg, respectively. The non-residential direct contact MSCs for these compounds are 10,000 µg/kg for cis-1,2-DCE, 1,500 µg/kg for TCE, and 580 µg/kg for vinyl chloride; the non-residential soil to groundwater used aquifer MSCs are 7,000 µg/kg, 500 µg/kg, and 200 µg/kg, respectively.

Trace concentrations of one or more of these three chlorinated VOCs were detected below the evaluation criteria in the samples collected from borings SB-105, SB-106, and SB-107, located around the perimeter of the former maintenance shop, to the east, north, and south, respectively.

Of the nine soil samples collected for laboratory analysis, the samples from boring SB-104 contained the highest concentrations of chlorinated VOCs. Samples from this boring contained TCE, cis-1,2-DCE, and vinyl chloride at concentrations above PADEP standards. Using the soil data collected in 2009 coupled with the most recent soil data, the VOCs above PADEP standards can be roughly delineated as shown on Figure 3. WSP would like to discuss options for the soil in this area as it is difficult to access due to the locations of the building, subsurface electric lines, and a large oxygen above ground storage tank.

Soil Vapor Extraction System

The soil vapor extraction (SVE) system installed in the grassy field west of the garage and just off the northeast corner of the garage (Figure 4), operated between November 2007 and October 2012. In the spring of 2008, it was found that water was accumulating in the extraction wells, particularly during and

following heavy precipitation events. To optimize vapor extraction from the SVE wells, pneumatic pumps were installed in four of the extraction wells in the grassy field and two of the extraction wells near the garage to remove accumulated water and prevent the screened intervals from being submerged. The following wells were selected based on results from short term pumping tests conducted in December 2008 and March 2009: SVE-1, SVE-2, SVE-7, SVE-8, SVE-9 and SVE-10. In addition, these wells are located in the area with the highest concentrations of VOCs detected in soil samples collected in November 2006.

In October 2012, an evaluation of current soil conditions was conducted in preparation for demonstrating attainment of the soil cleanup objectives pursuant to Pennsylvania's Act 2 requirements (PADEP Act 2 Used Aquifer Residential and Non-Residential Medium Specific Concentration [MSC]) and shut down of the SVE system. The areas sampled encompassed the previous soil boring locations where soil sample results exceeded the PADEP MSC of 500 µg/kg for TCE. The two areas (Area 1 and Area 2) are shown in Figure 4, and as the demonstration relies on a statistical analysis, a minimum number of samples was required. Based on a random selection process, 12 samples were collected within Area 1 and 8 samples from Area 2.

WSP has prepared a summary report demonstrating attainment within these two areas and would like to discuss the proper process for submittal and approval by PADEP of this report, followed by approval to decommission and remove the SVE system.

Residential Well Sampling Update

WSP collected water samples from the two wells on the Allebach family property located at 2151 Koffel Road (Village Scene Manufactured Home Park - Figure 1). Previous sampling events were conducted in 2007 and 2008. The recent sampling showed that TCE and PCE concentrations have decreased in both wells. TCE was detected at 9.9 µg/l (previously 50 µg/l) in the well used to supply water for washing cars and at 0.77 µg/l (previously 2.3 µg/l) in the well in the wood shop (which reportedly has not been used in many years). PCE was only detected in the well used to supply water for washing cars (2.7 µg/l, and previously at 4.1 µg/l). Neither well is used as a source of drinking water.

We appreciate you taking the time to review the site history, and we look forward to meeting you on Wednesday.

Sincerely yours,

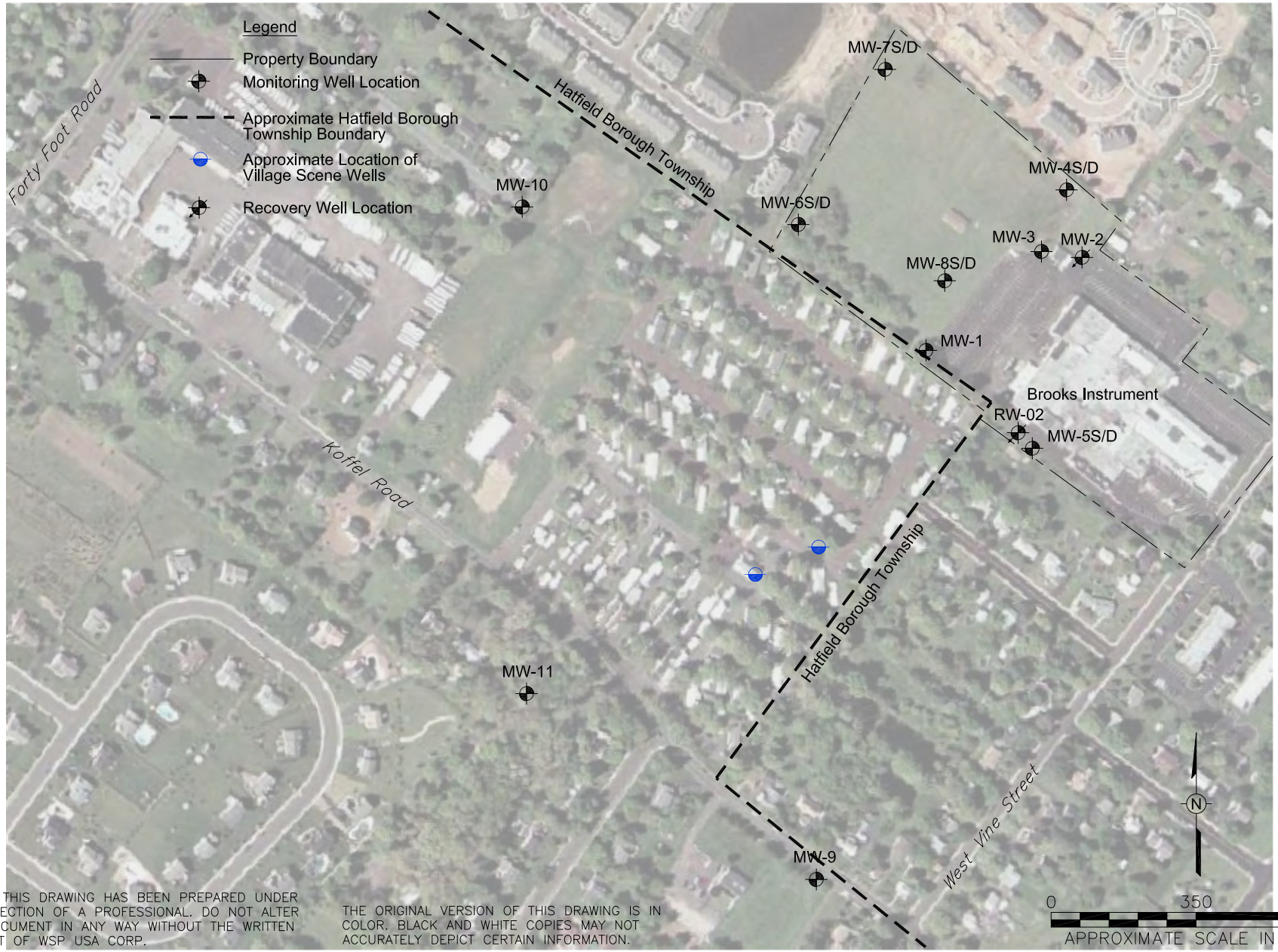
Lisa K. Bryda, P.G.
General Manager

LKB:
K:\Emerson\BROOKS\Hatfield,PA\131070_Brooks\Task 06_Act 2 Investigations\2_Correspondence\Outgoing\ 4712_13_0909LBLET_PADEP Update.docx

cc/encl.: Stephen L. Clarke, Emerson

Figures

R:\ACAD\CADD\00004712-Hatfield\CAD\00004712-015.dwg 9/9/2013 4:04 PM Usec01012



NOTICE: THIS DRAWING HAS BEEN PREPARED UNDER THE DIRECTION OF A PROFESSIONAL. DO NOT ALTER THIS DOCUMENT IN ANY WAY WITHOUT THE WRITTEN CONSENT OF WSP USA CORP.

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK AND WHITE COPIES MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

A

WSP
WSP USA Corp.
11190 Sunrise Valley Drive, Suite 300
Reston, Virginia 20191
(703) 709-6500
www.wspgroup.com/usa

Figure 1

SITE LAYOUT AND
MONITORING WELL LOCATIONS

BROOKS INSTRUMENT FACILITY
HATFIELD, PENNSYLVANIA

PREPARED FOR
BROOKS INSTRUMENT FACTILITY
HATFIELD, PENNSYLVANIA

Drawn By: EGC
Checked: ELK 09192011
Approved: LKS 09192011
DWG Name: 00004712-015

CALIBRATION ROOM

SB-31

SB-32

SB-33

SB-34

SINK

GLASS SHOP COMM AREA

SINK

SB-100

SB-101

SB-102

OFFICE

LIFT

SB-106

SB-103

SINK

GLASS AREA

SB-105

SB-104

SB-81

SB-77

SB-78

SB-80

SB-107

FORMER MAINTENANCE SHOP

02 TANK (OUTSIDE)

SB-75

SB-76

RW-02

MW-5S/D

SB-79

SB-82

PARKING

SIDEWALK

WEST VINE STREET

SIDEWALK

RESIDENTIAL AREA

LEGEND

- MONITORING WELL LOCATION
- SOIL BORING LOCATION (NOVEMBER 2006)
- SOIL BORING LOCATION (DECEMBER 2008)
- SOIL BORING LOCATION (JULY 2011)
- FORMER FLOOR DRAIN
- EQUIPMENT AREA
- FLOOR TRENCH
- MOVABLE EQUIPMENT AREA

0 50 100

APPROXIMATE SCALE IN FEET

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK AND WHITE COPIES MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

B

R:\ACAD\CADD\00004712-Hatfield\CAD\00004712-012.dwg 9/9/2013 4:07 PM USEC01012

Drawn By: JME

Checked: 09/9/2011

Approved: 09/9/2011

DWG Name: 00004712-012

BROOKS INSTRUMENT FACILITY
HATFIELD, PENNSYLVANIA

PREPARED FOR
BROOKS INSTRUMENT FACILITY
HATFIELD, PENNSYLVANIA

Figure 2

SITE LAYOUT WITH BORING LOCATIONS

WSP USA Corp.
11190 Sunrise Valley Drive, Suite 300
Reston, Virginia 20191
(703) 709-6500
www.wspgroup.com/usa

CALIBRATION ROOM

SB-31

SB-32

SB-33

SB-34

SB-75

SB-76

SB-81

SB-104

SB-77

SB-78

SB-80

SB-79

SB-82

RW-02

MW-5S/D

SINK

GLASS SHOP COMM AREA

SINK

SB-100

SB-101

SB-102

OFFICE

LIFT

SB-106

SB-103

SINK

GLASS AREA

SB-105

FORMER MAINTENANCE SHOP

SB-107

02 TANK (OUTSIDE)

APPROXIMATE AREA OF VOC-AFFECTED SOILS

RESIDENTIAL AREA

PARKING

SIDEWALK

SIDEWALK

SIDEWALK

WEST VINE STREET

LEGEND

- MONITORING WELL LOCATION
- SOIL BORING LOCATION (NOVEMBER 2006)
- SOIL BORING LOCATION (DECEMBER 2008)
- SOIL BORING LOCATION (JULY 2011)
- FORMER FLOOR DRAIN
- EQUIPMENT AREA
- FLOOR TRENCH
- MOVABLE EQUIPMENT AREA

0 50 100

APPROXIMATE SCALE IN FEET

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK AND WHITE COPIES MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

B

R:\ACAD\CADD\00004712-Hatfield\CAD\00004712-012.dwg 9/9/2013 4:07 PM USEC01012

Drawn By: EGC
Checked: 09/9/2011
Approved: 09/9/2011
DWG Name: 00004712-012

BROOKS INSTRUMENT FACILITY
HATFIELD, PENNSYLVANIA

PREPARED FOR
BROOKS INSTRUMENT FACILITY
HATFIELD, PENNSYLVANIA

Figure 3

VOC-AFFECTED SOILS
ABOVE PADEP STANDARDS

WSP USA Corp.
11190 Sunrise Valley Drive, Suite 300
Reston, Virginia 20191
(703) 709-6500
www.wspgroup.com/usa

RETENTION POND

EXISTING AIR STRIPPER EQUIPMENT

GARAGE

AREA 2

AREA 1

PICNIC PAVILION

GRASS

90° BEND

PARKING AREA

FACILITY

SB-1 SB-2 SB-6 SB-7 SB-8 SB-9 SB-10 SB-11 SB-12 SB-13 SB-14 SB-15 SB-16 SB-17 SB-18 SB-19 SB-20 SB-21 SB-22 SB-23 SB-24 SB-25 SB-26 SB-27 SB-28 SB-29 SB-30 SB-36 SB-37 SB-38 SB-39 SB-40 SB-41 SB-42 SB-43 SB-44 SB-45 SB-46 SB-47 SB-52 SB-53 SB-54 SB-55 SB-58 SB-59

MW-2 MW-3 MW-8

VW-1 VW-2 VW-3 VW-4 VW-5

SVE-1 SVE-2 SVE-3 SVE-4 SVE-5 SVE-6 SVE-7 SVE-8 SVE-9 SVE-10

6" 4" 3" 2"

LEGEND

- STORM DRAIN
- MONITORING WELL
- SOIL BORING (OCTOBER 2004)
- SOIL BORING (FEBRUARY/MARCH 2006)
- SOIL BORING (NOVEMBER 2006)
- EXTRACTION WELL
- VENT WELL
- CLEANOUT LOCATION
- SOIL BORING (OCTOBER 2012)

0 40 80

APPROXIMATE SCALE IN FEET

B

NOTICE: THIS DRAWING HAS BEEN PREPARED UNDER THE DIRECTION OF A PROFESSIONAL. DO NOT ALTER THIS DOCUMENT IN ANY WAY WITHOUT THE WRITTEN CONSENT OF WSP USA CORP.

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK AND WHITE COPIES MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

Drawn By: EGC
Checked: 10/18/2012
Approved:
DWG Name: 00004712-022

BROOKS INSTRUMENT FACILITY
HATFIELD, PENNSYLVANIA

PREPARED FOR
BROOKS INSTRUMENT FACILITY
HATFIELD, PENNSYLVANIA

Figure 4

SOIL SAMPLING AREAS 1 AND 2

WSP USA Corp.
11190 Sunrise Valley Drive, Suite 300
Reston, Virginia 20191
(703) 709-6500
www.wspgroup.com/usa

Enclosures

WSP
ENVIRONMENTAL STRATEGIES

11911 Freedom Drive, Ninth Floor • Reston, Virginia 20190 • (703) 709-6500 • Fax (703) 709-8505

VIA ELECTRONIC MAIL

January 24, 2007

Stephan Sinding
Manager, Environmental Cleanup Program
Pennsylvania Department of Environmental Protection
2 E. Main Street
Norristown, PA 19401

Re: Brooks Instrument Facility, Hatfield, Pennsylvania

Dear Mr. Sinding:

On behalf of Emerson, WSP Environmental Strategies LLC has prepared this summary letter describing the historical environmental investigations and results for the Brooks Instrument facility located at 407 West Vine Street in Hatfield, Pennsylvania. We are providing this to you in preparation for the upcoming meeting on January 25, 2007, with Emerson, WSP Environmental Strategies, and the Pennsylvania Department of Environmental Protection (PADEP) to discuss entering the site into the Voluntary Cleanup Program under the PADEP Act 2 (Land Recycling and Environmental Remediation Standards Act).

Regulatory History

The site (Figure 1) has been the subject of a soil removal and groundwater treatment project initiated in 1979. The PADEP conducted an inspection of the Brooks facility on August 24, 1979 (PADEP letter to Brooks Instrument, dated August 31, 1979) and noted that during past operations of the plant, waste materials including oils and trichloroethene (TCE) had been released to the ground surface. Therefore, the PADEP required remediating contaminated soils in the area where TCE and waste solvents were stored and released to the ground (garage area, Figure 2), removing abandoned waste tanks, pressure testing the existing waste tank, preparing a pollution prevention plan, and hiring a consultant to locate and install monitoring/recovery wells in the contaminated area. Brooks contracted with SMC-Martin to perform the required activities.

According to a letter report submitted to Brooks by SMC-Martin on May 9, 1980, two waste storage tanks and the surrounding soils were removed from the garage area and the area was backfilled with clean fill materials. Samples of the contaminated soil were analyzed for constituents specified by the landfill and were transported to a landfill in Boyertown, Pennsylvania, for disposal. The report did not include any information on the excavation limits or the total volume of soil removed from the site, and no confirmation soil samples were collected following the excavation. The report states that other areas of the site were examined as possible sources of TCE, but none were found. Pressure testing results for the TCE storage tank

indicated that it was not leaking. Based on the report, three groundwater monitoring wells (MW-1, M-2, and MW-3) were installed at the property in October 1979 to establish groundwater monitoring points, provide data regarding the underlying geology of the site, and aid in determining the feasibility of a groundwater recovery program. In addition to sampling these wells, two Hatfield Borough wells (Nos. 5 and 7) and a private well near the site (Allenbach Trailer Park) were also sampled to monitor the distribution of TCE in the groundwater in the vicinity of the site. Samples were initially collected on a weekly, biweekly, or monthly basis. Many samples indicated the presence of TCE and tetrachloroethene (PCE), some being above the maximum contaminant level in Borough well No. 5 and the Allenbach Trailer Park well. Hatfield Borough well No. 5 had been removed from service in August 1979 after the discovery of TCE in the well. It is our understanding that the well was temporarily returned to service with the authorization of PADEP and then permanently shut down again in 1988. The Allenbach Trailer Park well was shut down in 1986, and the site was connected to the municipal water supply. Samples from Hatfield Borough well No. 7 rarely had detections of TCE and PCE, and those samples that did have detections were less than microgram per liter. This well was also shut down in the late 1980s.

Remedial Activities

To reduce the concentrations of VOCs in groundwater, an airlift pumping system was initially installed in well MW-3 in 1980 and was effective for reducing the concentrations of VOCs in the groundwater. In 1981, an air stripper was installed near the onsite garage and well MW-3 was retrofitted to accommodate the air stripper operation. The air stripper has been operating nearly continuously since that time with only minor shutdowns for maintenance or onsite investigation activities. The discharge from the air stripper is routed to an onsite retention pond and is permitted under a National Pollutant Discharge Elimination System permit (NPDES Permit No. PA0054402). According to the permit, groundwater samples are to be collected from the monitoring wells quarterly and from the air stripper discharge monthly. The results are submitted to the PADEP monthly in Discharge Monitoring Reports and annually in a groundwater monitoring report. Permitted discharge parameters have been consistently met throughout operation of the system. The average flow rate is 7.5 gallons per minute.

During remediation, VOCs, including TCE and several of its degradation products (i.e., 1,1-dichloroethene [1,1-DCE], *cis*- and *trans*- isomers of 1,2-DCE, and vinyl chloride) and PCE, were detected in the bedrock groundwater underlying the facility. In 1998, the PADEP no longer required analyzing the groundwater samples for constituents other than TCE, PCE, and pH. A historical summary of TCE and PCE results in monitoring wells MW-1, MW-2, and MW-3 is presented in Table 1. The data were obtained from monitoring reports prepared by previous consultants and letters from Brooks that were submitted to the PADEP from 1979 to 2005. Data gaps exist, however, mainly between 1989 and 1993.

Groundwater flow directions appear to have changed since local municipal supply wells were shut down in the mid to late 1980s. During historical municipal well operations, groundwater appears to have flowed to the north-northwest across the site. However, since the wells have ceased operation, the natural groundwater flow direction appears to be to the west.

Soil Investigations

WSP Environmental Strategies conducted a soil investigation in October 2004. The soil samples collected from 12 direct-push borings installed in the grassy area west of the garage (Figure 2) contained a number of VOCs, including TCE and PCE. None of the concentrations exceeded the PADEP non-residential direct contact soil standards; however, two soil borings (SB-2 and SB-10) contained TCE and PCE above the PADEP residential soil to groundwater standard of 500 micrograms per kilogram (μg/kg).

A second soil investigation including 18 (SB-13 to SB-30) direct push borings was conducted in February 2006 in the area of the former tank removal action near the garage (Figure 2). While all but one soil sample collected from these borings contained TCE and PCE, only three samples contained concentrations of TCE above the PADEP residential soil to groundwater standard of 500 μg/kg.

A third soil investigation was conducted in November 2006 (Figure 2) and included installing 25 direct push soil borings (SB-35 through SB-59). The boring locations were spaced on a 50-foot grid spacing, expanding upon the previous boring investigation in the same area. The VOCs TCE and PCE were detected in three soil samples at concentrations above the PADEP residential soil-to-groundwater standard of 500 μg/kg at depths of 0 to 4 feet and 8 to 10 feet. Three additional soil borings (SB-31 to SB-33) were also installed inside the building (Figure 2) adjacent to the sewer line in areas where former TCE degreasers were located. Trichloroethylene was detected in three samples at concentrations between 2 μg/kg and 290 μg/kg between 1 to 3 feet below the concrete slab.

Groundwater Investigations

Other investigations conducted by WSP Environmental Strategies between September 2005 and November 2006 have focused on identifying bedrock fractures potentially responsible for the presence of VOC-affected groundwater in the monitoring wells. The investigations included a surface geophysical survey along five transects; downhole logging of fluid temperature, conductivity, borehole diameter, and borehole flow using an optical/acoustic televiewer and heat-pulse sensor; installing five bedrock groundwater monitoring wells; and discrete interval groundwater sampling using passive diffusion bag samplers and low-flow techniques. All of the new monitoring wells were installed with steel surface casings to a depth of approximately 21 feet below ground surface (bgs; depth to bedrock averaged 5 feet below grade) with an open borehole below to approximately 128 feet.

The downhole logging activities identified numerous sealed fractures and a few open to partially open fractures in each monitoring well. The downhole logging investigations also identified two predominant fracture orientations; one low-angle set striking south and dipping gently to the west (likely bedding plane partings), while a second high-angle set strikes north-northeast and dips steeply to the south-southeast (likely joint sets). Based on optical televiewer logs, fractures associated with the high-angle fracture set are often truncated at bedding planes and commonly mineralized. The results of discrete groundwater sampling near the fractures indicate that the highest TCE and PCE concentrations are associated with the shallowest (55 to 65 feet bgs) open

and partially open fractures below the water table. In monitoring wells MW-2 and MW-3, these fractures are part of the high-angle fracture set. In the remaining monitoring wells, the shallowest open and partially open fractures are associated with the low-angle fracture set. Newly installed well MW-5, located along the western side of the building, contains the highest concentration of TCE at the present time (320 micrograms per liter).

The depth to water in each monitoring well was measured several times during the investigations. Based on the measurements taken during a non-pumping period (September 2005 to March 2006), static water levels appear to range from approximately 48 to 55 feet below the top of casing (elevations of 296.47 feet to 293.80 feet). Following installation of the five new wells in late 2006, water level elevations collected following a period of non-pumping conditions indicate a westerly flow direction. In addition, vertical flow was measured during non-pumping conditions between each open fracture in wells MW-1, MW-2, and MW-3. It was determined that there is very little vertical flow between any of the fractures measured, except for a few measurements in well MW-2, where there was a slight upward gradient. This upward flow may be minimizing the downward migration of VOCs.

Recent groundwater results collected between November 2005 and December 2006 for all monitoring wells at the site are presented in Tables 2 and 3. Monitoring wells MW-3, located near the garage, and MW-5, located on the western side of the manufacturing building, contain the highest concentrations of TCE and PCE.

Closing

We look forward to our meeting tomorrow where we can discuss in more detail the investigation results for the site. Please contact Steve Clarke of Emerson at 314-553-1953, or Lisa Bryda of WSP Environmental Strategies or me at 703-709-6500, if there are any issues you would like to discuss before the meeting.

Sincerely yours,

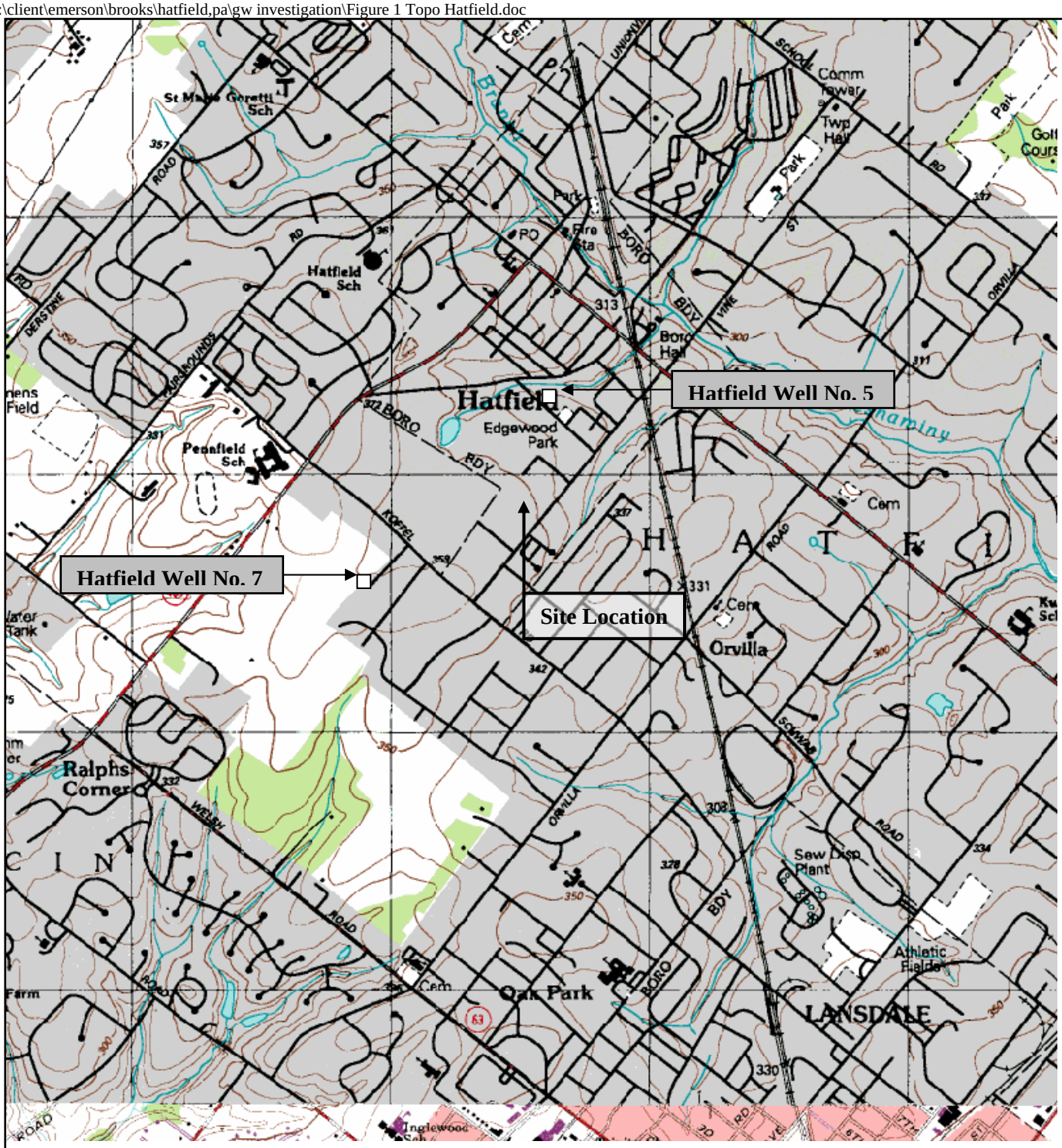
John A. Simon
Executive Vice President

LKB:jas:slp
K:\$Client\Emerson\BROOKS\Hatfield,PA\PADEP Meetings\FinalLetPADEPMtgJan07.doc

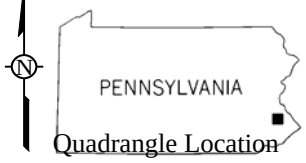
Enclosures

cc\encl: Jennifer Giblin, Esquire, Pillsbury Winthrop Shaw Pittman LLP
Stephen L. Clarke, Emerson

q:\client\emerson\brooks\hatfield,pa\gw investigation\Figure 1 Topo Hatfield.doc



Reference
7.5 Minute Series Topographic Quadrangle
Telford, Pennsylvania
Photorevised 2000 Scale 1:24,000



ENVIRONMENTAL STRATEGIES CONSULTING LLC
11911 FREEDOM DRIVE, SUITE 900
RESTON, VIRGINIA 20190
703-709-6500

Figure 1
Site Location
Brooks Instrument
Hatfield, Pennsylvania

Legend

- Storm Drain
- Monitoring Well
- Soil Boring (October 2004)
- Soil Boring (February/March 2006)
- Soil Boring (November 2006)
- Sump Sediment Sample
- Former Large Solvent Degreaser Location
- Former Small Vapor Degreaser Location
- Floor Drain Location
- Sewer Line

Residential Area

MW-4

MW-7

Retention Pond

SB-15 SB-19 SB-18 SB-20 SB-17 SB-16 SB-13 SB-21 SB-14 SB-22 MW-2 SB-23 SB-42 SB-26 SB-24 MW-3 Garage SB-27 SB-25 SB-40 SB-41 SB-30 SB-29 SB-28

Picnic Pavilion

SB-47 SB-39 SB-8 SB-59 SB-12 SB-1 SB-38

Residential Area

SB-54 SB-7 SB-53 SB-10 SB-55 SB-45 SB-37 Grass SB-11 MW-8 SB-44 SB-2 SB-46 SB-52 SB-6 SB-58 SB-9 SB-43 SB-36

SB-57 SB-51 SB-5 SB-3 SB-35 MW-6 SB-49 SB-56 SB-50 SB-48 SB-4 MW-1

Calibration Room

SB-31 SB-32 SB-33

Parking

West Vine Street

Residential Area

MW-5

Residential Area

0 100

Scale in Feet

Figure 2
Site Layout with Monitoring Wells and Soil Boring Locations
Brooks Instrument Facility
Hatfield, Pennsylvania

13107026.DWG

11911 Freedom Drive Suite 900
Reston, Virginia 20190
(703) 709-6500

WSP
Environmental Strategies

Table 1

Historical Groundwater Results for TCE and PCE (ug/l) (a)
Brooks Instrument Facility
Hatfield, Pennsylvania

	TCE				PCE		
Date	**MW-1**	**MW-2**	**MW-3**		**MW-1**	**MW-2**	**MW-3**
10/5/1979	84	50	NR		5	3	NR
10/10/1979	49	158	616		3	NR	42
10/17/1979	62	164	1,940		NR	NR	NR
10/24/1979	34	160	650		2.4	11	40
11/5/1979	43	140	1,300		3	8.7	95
11/8/1979	33	210	2,300		2.2	146	184
11/17/1979	42	161	NR		3	12	NR
11/29/1979	63	274	3,300		5	19	38
12/5/1979	48	258	4,000		3.5	19	460
12/14/1979	55	202	1,300		4.5	17	125
12/24/1979	61	220	1,270		25	24	140
1/10/1980	47	260	690		4	23	63
1/28/1980	54	301	3,400		8.9	44	869
2/8/1980	53	173	0.0	MW-3	4	12	NR
2/15/1980	62	180	0.7	Pumping	51	130	NR
2/29/1980	57	93	0.8	Well	4.8	5.9	NR
3/7/1980	53	21	1.2	↓	3.5	0.8	0.3
3/13/1980	54	160	3.8		4.4	11	NR
3/21/1980	48	191	1.3		3.8	13	NR
3/28/1980	41	145	1.3		3.6	9.6	NR
4/3/1980	51	120	1.8		4.3	7.3	0.1
4/11/1980	48	140	1.7		4	8	NR
4/18/1980	54	160	0.1		4.9	9.8	NR
4/25/1980	42	110	1.7		3.5	6.4	NR
5/8/1980	47	110	2		4	6.6	0
5/23/1980	50	99	1.5		4.6		0
6/5/1980	49	150	2.2		4.5	9	0.1
6/20/1980	NR	NR	2.5		NR	NR	0
6/26/1980	NR	NR	2.1		NR	NR	0
7/3/1980	NR	NR	2.3		NR	NR	0
7/10/1980	46	180	2		4.1	9.8	0
7/17/1980	NR	NR	2.4		NR	NR	0
7/23/1980	NR	NR	2.4		NR	NR	0
7/30/1980	NR	NR	2.7		NR	NR	0.1
8/7/1980	20	140	NR		1.2	8.1	
8/20/1980	NR	NR	4.3		NR	NR	0.4
8/27/1980	NR	NR	1.3		NR	NR	0
9/4/1980	NR	NR	1.3		NR	NR	0.1

Table 1

Historical Groundwater Results for TCE and PCE (ug/l) (a)
Brooks Instrument Facility
Hatfield, Pennsylvania

	TCE			PCE		
Date	**MW-1**	**MW-2**	**MW-3**	**MW-1**	**MW-2**	**MW-3**
9/10/1980	51	170	1.3	4.1	19	0.1
9/16/1980	NR	NR	1.2	NR	NR	0
9/26/1980	NR	NR	1.6	NR	NR	0.2
10/3/1980	NR	NR	1.3	NR	NR	0.1
10/10/1980	40	230	330	2.7	16	NR
11/14/1980	26	95	NR	1.8	5.1	NR
12/18/1980	NR	60	NR	NR	3.2	NR
1/19/1981	NR	68	NR	NR	3.5	NR
2/20/1981	NR	220	NR	NR	9.9	NR
3/20/1981	10	77	NR	0.7	3.8	NR
4/16/1981	8	270	NR	0.5	14	NR
5/22/1981	17	120	NR	1	8.2	NR
5/29/1981	NR	NR	21	NR	NR	1.1
6/15/1981	NR	NR	21	NR	NR	0.8
6/12/1981	NR	NR	19	NR	NR	0.7
6/19/1981	NR	50	25	NR	1.7	1.4
6/26/1981	NR	NR	21	NR	NR	0
7/1/1981	NR	NR	19	NR	NR	0.6
7/10/1981	NR	NR	22	NR	NR	0.9
7/17/1981	NR	NR	19	NR	NR	0.8
7/24/1981	33	550	22	1.2	24	0.2
7/31/1981	NR	NR	15	NR	NR	0
8/7/1981	NR	NR	14	NR	NR	0
8/14/1981	NR	NR	12	NR	NR	0
8/21/1981	5	540	12	0.6	26	0
8/28/1981	NR	NR	18	NR	NR	0.6
9/4/1981	NR	NR	17	NR	NR	0.6
9/11/1981	NR	NR	20	NR	NR	0.6
9/25/1981	NR	NR	16	NR	NR	4.8
10/16/1981	NR	220	NR	NR	9.4	NR
11/13/1981	4	320	NR	0.3	12	NR
12/18/1981	NR	190	NR	NR	0.7	NR
1/22/1982	NR	190	NR	NR	7.1	NR
2/19/1982	5	160	NR	0.4	5.1	NR
3/19/1982	6	160	NR	0.2	6.3	NR
4/16/1992	4	82	NR	0.3	3	NR

Table 1

Historical Groundwater Results for TCE and PCE (ug/l) (a)
Brooks Instrument Facility
Hatfield, Pennsylvania

	TCE				PCE		
Date	**MW-1**	**MW-2**	**MW-3**		**MW-1**	**MW-2**	**MW-3**
7/13/1993	65	910	85		11	27	4.5
12/8/1993	53	570	93		7.8	28	5
3/28/1994	73	840	94		11	32	5
6/2/1994	58	960	84		8	30	4
7/15/1994	58	140	97		8	10	5
10/24/1994	61	790	130		7	30	5
1/4/1995	100	640	120		15	25	5.5
4/7/1995	160	700	140		20	25	6
7/1/1995	300	150	130		41	8.9	4.4
10/1/1995	88	410	110		15	22	4.9
1/1/1996	110	570	110		11	18	3
5/1/1996	290	580	110		47	32	6
8/15/1996	290	1,100	<1.0		45	30	0.5
12/10/1996	310	570	260		62	45	30
3/11/1997	260	960	300		50	48	10
6/9/1997	56	4	74		10	12	9
12/9/1997	220	100	230	MW-2 &	40	30	15
3/4/1998	110	200	160	MW-3	25	25	15
6/10/1998	92	930	NR	Pumping	15	34	NR
9/29/1998	69	400	23	MW-2	11	15	1.2
12/17/1998	66	350	42	Pumping	8	14	2
3/24/1999	45	420	42	Well	4	2.5	0.8
6/25/1999	63	390	49	↓	8	10	2
9/17/1999	58	550	27		8	18	0.8
12/9/1999	57	370	69		6	21	3
3/21/2000	72	320	360		10	12	15
6/30/2000	180	360	77		24	9	3
9/13/2000	80	340	67		11	12	2
Dec-00	47	330	93		6	10	3
3/14/2001	170	450	74		30	15	2
Jun-01	170	350	29		34	14	1
9/28/2001	47	340	84		6	10	3
Dec-01	48	360	79		6	10	5
3/14/2002	45	410	47		4	8	2
Jun-02	43	290	40		5	10	2
12/30/2002	24	400	55		3	14	2
Mar-03	41	350	150		5	13	6
6/16/2003	60	350	44		10	14	1

Table 1

Historical Groundwater Results for TCE and PCE (ug/l) (a)
Brooks Instrument Facility
Hatfield, Pennsylvania

	TCE			PCE		
Date	**MW-1**	**MW-2**	**MW-3**	**MW-1**	**MW-2**	**MW-3**
9/1/2003	110	310	130	31	15	5
No pumping from 11/03 to 6/04						
6/22/2004 (b)	190	NR	48	42	NR	2
7/28/2004	160	360	2,000	46	26	55
9/1/2004	10	330	72	13	8.8	1.6
12/1/2004	4	450	80	12	12	1.6
3/1/2005	40	480	100	21	19	3.2
6/1/2005	2	140	36	12	11	<1.0

a/ NR - not reported
b/ Samples were collected from unpurged wells.
Approximate time for airlift pumping system
Approximate time for air stripper system

Table 2

Groundwater Sample Results for Trichloroethene (ug/l)
November 2005 - December 2006
Brooks Instrument Facility
Hatfield, Pennsylvania

	Nov-05	Mar-06	Jun-06	Sep-06	Dec-06
MW-1					
59 feet	NS	2	NS	2	4
70 feet	1.6	NS	2	1/2 (c)	2
84 feet	1.8	NS	NS	NS	NS
98 feet	1.7	1	1	1	2
105.5	2.4	NS	NS	NS	NS
112	2.2	NS	NS	NS	NS
MW-2					
Influent	NS	NS	44	NS	37/36 (c)
62.5 feet	670 D	59	NS	NS	NS
77.5 feet	82	25	NS	NS	NS
86.5 feet	61	NS	NS	NS	NS
94.5 feet	65	22	NS	NS	NS
101 feet	62	NS	NS	NS	NS
114 feet	67	NS	NS	NS	NS
125.5 feet	72	24	NS	NS	NS
MW-3					
54.5 feet	NS	180	25	56	530 E
60 feet	44	NS	NS	NS	NS
85 feet	21	NS	NS	NS	NS
111 feet	29	NS	NS	NS	NS
131 feet	24	NS	NS	NS	NS
140 feet	33	NS	NS	NS	NS
146.5 feet	31	15	16	4	48
160 feet	46	NS	NS	NS	54
178.5 feet	28	NS	NS	NS (b)	NS (b)
198 feet	24	15	15	--	--
211 feet	19	NS	NS	--	--
227 feet	17	NS	NS	--	--
237.5 feet	13	7	9/3 (c)	--	--
262 feet	10	NS	NS	--	--
290 feet	9.5	NS	NS	--	--
302.5 feet	8.7	NS	NS	--	--
MW-4					
61 feet	NI	NI	NI	11/9 (c)	3/3 (c)
80.5 feet	NI	NI	NI	3	NS
82.5 feet	NI	NI	NI	NS	2
120.5 feet	NI	NI	NI	2	NS
123 feet	NI	NI	NI	NS	3

Table 2

Groundwater Sample Results for Trichloroethene (ug/l)
November 2005 - December 2006
Brooks Instrument Facility
Hatfield, Pennsylvania

	Nov-05	Mar-06	Jun-06	Sep-06	Dec-06
MW-5					
58 feet	NI	NI	NI	270/280 (c)	NS
59 feet	NI	NI	NI	NS	280 E
64 feet	NI	NI	NI	NS	300 E
65 feet	NI	NI	NI	150	NS
69 feet	NI	NI	NI	NS	310 E
87 feet	NI	NI	NI	110	320
108.5 feet	NI	NI	NI	99	NS
115 feet	NI	NI	NI	110	NS
MW-6					
70 feet	NI	NI	NI	NS	37
70.5 feet	NI	NI	NI	42	NS
88 feet	NI	NI	NI	44	54
MW-7					
56 feet	NI	NI	NI	1	NS
57 feet	NI	NI	NI	NS	1
61 feet	NI	NI	NI	ND	1
66 feet	NI	NI	NI	ND	NS
79.5 feet	NI	NI	NI	ND	NS
93.5 feet	NI	NI	NI	ND	ND
MW-8					
62.5 feet	NI	NI	NI	NS	29/26 (c)
65 feet	NI	NI	NI	13	NS
70 feet	NI	NI	NI	5	NS
83 feet	NI	NI	NI	3	NS
97.5 feet	NI	NI	NI	3	NS
100 feet	NI	NI	NI	NS	3

a/ NS - not sampled, NI - not installed, D - sample was diluted, U - not detected,
E - preliminary result exceeds calibration range

b/ Well was grouted from bottom (325 feet) to 172 feet.

c/ Duplicate samples

Results for November 2005 are from passive diffusive bag samplers; remaining samples were collected using low-flow sampling techniques

Table 3

Groundwater Sample Results for Tetrachloroethene (ug/l)
November 2005 - December 2006
Brooks Instrument Facility
Hatfield, Pennsylvania

	Nov-05	Mar-06	Jun-06	Sep-06	Dec-06
MW-1					
59 feet	NS	6	NS	12	13
70 feet	13	NS	7	7/8 (c)	7
84 feet	14	NS	NS	NS	NS
98 feet	14	4	5	5	6
105.5 feet	13	NS	NS	NS	NS
112 feet	14	NS	NS	NS	NS
MW-2					
Influent	NS	NS		NS	18/18 (c)
62.5 feet	50	28	NS	NS	NS
77.5 feet	31	24	NS	NS	NS
86.5 feet	29	NS	NS	NS	NS
94.5 feet	30	19	NS	NS	NS
101 feet	29	NS	NS	NS	NS
114 feet	29	NS	NS	NS	NS
125.5 feet	31	16	NS	NS	NS
MW-3					
54.5 feet	NS	2	ND	11	23
60 feet	1.3	NS	NS	NS	NS
85 feet	ND	NS	NS	NS	NS
111 feet	ND	NS	NS	NS	NS
131 feet	ND	NS	NS	NS	NS
140 feet	ND	NS	NS	NS	NS
146.5 feet	ND	ND	ND	7	11
160 feet	ND	NS	ND	NS	12
178.5 feet	ND	NS	ND	NS (b)	NS (b)
198 feet	ND	ND	ND	--	--
211 feet	ND	NS	NS	--	--
227 feet	ND	NS	NS	--	--
237.5 feet	ND	ND	ND (c)	--	--
262 feet	ND	NS	NS	--	--
290 feet	ND	NS	NS	--	--
302.5 feet	ND	NS	NS	--	--
MW-4					
61 feet	NI	NI	NI	12/11 (c)	10/9 (c)
80.5 feet	NI	NI	NI	10	NS
82.5 feet	NI	NI	NI	NS	9
120.5 feet	NI	NI	NI	8	NS
123 feet	NI	NI	NI	NS	9

Table 3

Groundwater Sample Results for Tetrachloroethene (ug/l)
November 2005 - December 2006
Brooks Instrument Facility
Hatfield, Pennsylvania

	Nov-05	Mar-06	Jun-06	Sep-06	Dec-06
MW-5					
58 feet	NI	NI	NI	43/43 (c)	NS
59 feet	NI	NI	NI	NS	55
64 feet	NI	NI	NI	NS	53
65 feet	NI	NI	NI	20	NS
69 feet	NI	NI	NI	NS	42
87 feet	NI	NI	NI	4	36
108.5 feet	NI	NI	NI	3	NS
115 feet	NI	NI	NI	3	NS
MW-6					
70 feet	NI	NI	NI	NS	7
70.5 feet	NI	NI	NI	8	NS
88 feet	NI	NI	NI	8	8
MW-7					
56 feet	NI	NI	NI	3	NS
57 feet	NI	NI	NI	NS	4
61 feet	NI	NI	NI	4	6
66 feet	NI	NI	NI	8	NS
79.5 feet	NI	NI	NI	13	NS
93.5 feet	NI	NI	NI	13	13
MW-8					
62.5 feet	NI	NI	NI	NS	13/12 (c)
65 feet	NI	NI	NI	7	NS
70 feet	NI	NI	NI	6	NS
83 feet	NI	NI	NI	6	NS
97.5 feet	NI	NI	NI	6	NS
100 feet	NI	NI	NI	NS	27

a/ NS - not sampled, NI - not installed, D - sample was diluted, U - not detected, E - preliminary result exceeds calibration range

b/ Well was grouted from bottom (325 feet) to 172 feet.

c/ Duplicate samples

Results for November 2005 are from passive diffusive bag samplers; remaining samples were collected using low-flow sampling techniques

WSP
ENVIRONMENTAL STRATEGIES

11911 Freedom Drive, Ninth Floor • Reston, Virginia 20190 • (703) 709-6500 • Fax (703) 709-8505

November 14, 2007

Ms. Jessica Kasmari
Geologic Specialist
ECP Special Projects
Pennsylvania Department of Environmental Protection
2 E. Main Street
Norristown, PA 19401

Re: Update on Brooks Instrument Facility, Hatfield, Pennsylvania

Dear Ms. Kasmari:

As you are aware, Emerson, the parent company of Brooks Instruments, has been conducting investigation and remediation activities at the Brooks Instrument site in Hatfield, Pennsylvania. Emerson and WSP Environmental Strategies LLC met with PADEP to discuss the site activities on January 25, 2007. During this meeting, we discussed conducting these activities under the Voluntary Cleanup Program under the Pennsylvania Department of Environmental Protection (PADEP) Act 2 (Land Recycling and Environmental Remediation Standards Act). A Notice of Intent to Remediate was subsequently submitted to PADEP on February 2, 2007.

On behalf of Emerson, WSP Environmental Strategies has prepared this summary letter describing the recent environmental investigations conducted at the Brooks Instrument facility in Hatfield since February 2007. The activities included excavating 281 tons of soil containing trichloroethene (TCE) above the PADEP residential medium-specific soil to groundwater standard of 500 micrograms per kilogram (µg/kg), conducting a soil vapor extraction (SVE) pilot test to evaluate the remedial option for treating soils containing TCE at concentrations one to two times higher than the PADEP medium-specific cleanup guideline, and conducting a door-to-door well survey in the vicinity of the site followed by collecting water samples from private wells identified during the survey. Additionally, two offsite groundwater monitoring wells were installed and sampled in June 2007. Each of these activities is discussed below.

Excavation

Investigation activities conducted at the Brooks site indicated that an area of soil containing TCE was present in the central portion of the site. Specifically, there were three areas of soil with TCE above the medium specific concentrations, an unpaved area just west of the parking lot, an unpaved area northeast of the garage, and a paved area west of the garage. The first two areas are designated for SVE (the SVE pilot test is discussed below) and the third area was excavated. The excavation was located in the vicinity of soil boring SB-38 (Figure 1) within an approximate area of 30 feet by 40 feet to an approximate depth of 4 feet (top of bedrock). A total of 281 tons of soil were excavated. The remedial action was conducted by an independent qualified remedial

subcontractor (Remediation Services, Inc., of Independence, Kansas) under contract with WSP Environmental Strategies. WSP Environmental Strategies provided construction oversight during implementation of the excavation activities. Existing data along the perimeter of the proposed excavation were used for delineation guidance. Confirmation soil samples were collected from the four sidewalls and the base of the excavation. The excavation was backfilled with clean fill from Blooming Glen Quarry, in Blooming Glenn, Pennsylvania, following receipt of analytical data indicating that the confirmation soil samples contained less than 500 µg/kg of TCE. Following placement of the backfill, the asphalt surface was replaced to repair the parking lot area.

The excavated soil was managed as an F001 listed waste and transported to a permitted disposal facility in Belleville, Michigan (Wayne Disposal, Inc.).

SVE Pilot Study

Two non-contiguous areas were identified as potential candidates (near SB-55 and near SB-15; Figure 1) for SVE. Based on the review of boring logs collected during the installation of boreholes in both areas, the soil types were identified as being similar in type (lean dry silt). As a result, the information obtained from conducting the pilot test on one of the areas was expected to be applicable to the other area for full-scale design purposes. Therefore, only one area (near SB-55) was selected for the pilot test.

The SVE pilot study generally involved applying a vacuum to the subsurface soils and monitoring the response of the vadose zone during the test. The study included an initial vacuum step test followed by an extended continuous vacuum test. Based on discussions with the PADEP, no off-gas treatment was required based on the expected VOC emissions.

Well Conceptual Design

Four wells were installed to perform the SVE pilot test, an extraction well and three observation wells. All wells were constructed of 2-inch inside-diameter (ID) schedule 40 polyvinyl chloride (PVC) with 5 feet (maximum) of screen extending upward from the top of the bedrock (approximately 10 or 11 feet below ground surface [bgs]). The bentonite seals were installed using the gravity method. Each well was completed with a flush-mount cap and concrete apron.

Stepped SVE Test

The objective of the stepped SVE test was to evaluate the optimum vacuum to operate the extended test. A regenerative blower was used to perform the stepped and extended portions of the SVE test. The blower had a maximum flow of 50 standard cubic feet per minute and a maximum vacuum of 100 inches of water. The blower was equipped with a static pressure gauge on the inlet side and a flow rate gauge on the discharge side. These gauges indicated pressure and velocity that were used to monitor air flow and pressure through the system. The inlet side also contained a dilution air valve to control the applied vacuum or flow rate. The discharge side of the blower contained a sample port to collect vapor samples so the results could be used to estimate the rate of VOC removal. Flow was measured on both sides of the blower to

determine the actual flow from the SVE well and the total flow for mass removal calculations. The air samples were collected following summa canister sampling procedures in accordance with U.S. Environmental Protection Agency (EPA) standard operating procedures (EPA 1994).

The SVE system included an air/water separator to ensure that water droplets were not transferred through the system. Water generated during the pilot test was to be managed as a hazardous waste and shipped offsite; however, no water was generated during operation of the pilot test.

A stepped test was initially performed. The relative impermeability of the vadose zone soils showed that the vacuum response was greatest with the blower operating at full capacity. The extended test was then immediately started.

Extended Test

The purpose of the extended test was to determine the effectiveness of SVE under actual site conditions, to determine the radius of influence (ROI) within the vadose zone, and to develop optimal operating parameters in the event a full-scale SVE system is utilized. The extended test was run for approximately 18 hours. Weather conditions prevented running the test for a longer duration and it was assumed that sufficient data had been collected to evaluate whether SVE is an appropriate remedial alternative for these soils. The extended test provided information to determine how the formation responds to a sustained vacuum over time, including the effect on the ROI and VOC removal. Vacuum readings from the observation wells were taken periodically during the extended test and a vapor sample was collected during and at the end of the extended test. The data generated from the extended test will be used to enable a baseline approximation of initial VOC removal rates and determine the long-term effects on the ROI and flow rate.

The data collected from the SVE pilot test was evaluated and SVE was selected as an appropriate remedial alternative for reducing VOC concentrations remaining in soils at the site to levels below the PADEP medium-specific guidelines. The full-scale SVE system was installed between October 22 and November 10, 2007. The PADEP approved that a formal NPDES permit modification is not required for adding the water generated by the SVE system air/water separator to the air stripper for treatment. In addition, WSP Environmental Strategies completed a Request for Determination for the PADEP on May 18, 2007, to ascertain the need for an operating permit or plan approval would be required for the SVE system. On June 25, 2007, a response was received from the PADEP stating that no plan approval would be required.

Offsite Well Survey and Investigation

WSP Environmental Strategies conducted a door-to-door well survey of approximately 150 homes within approximately 0.75 mile of the Brooks site during the week of February 27, 2007. If residents were not at home, a letter describing the nature of the visit and a questionnaire were left at the home along with a self-addressed stamped envelope. In addition, a second attempt to contact the resident at the home was made the following day. The questionnaire requested

information regarding the presence of a well on the property as well as detailed information about the well (e.g., use, construction, location, age).

To date, information has been obtained from approximately 60 percent of homes within the surveyed area including both verbal information and returned questionnaires. Thirteen private wells have been identified within 0.75 mile of the Brooks facility, eight of which are located downgradient of the site. The two wells located the greatest distance (0.60 and 0.75 mile) from the site are the only wells used for domestic drinking water purposes. The remaining wells remain open, but either are not used, have been abandoned, or are used for car washing or irrigation purposes. WSP Environmental Strategies sampled six private wells that were accessible and where the owner gave permission to sample. Emerson provided all sample results for the private wells to the homeowners and to the PADEP.

All private well sample results, except for the trailer park well, contained less than 2 micrograms per liter (µg/l) TCE or perchloroethene (PCE). The two wells that are used for drinking water contained less than 1.5 µg/l PCE and less than 1 µg/l TCE, both of which are well below the human health protection standards for drinking water of 5 µg/l as established by the PADEP and the EPA for both chemicals. The groundwater sample collected from the holding tank connected to the well at the trailer park contained 50 µg/l of TCE and 5 µg/l of PCE. The water from this well is only used for washing cars at the trailer park. The results of the sampling as well as information obtained during the well survey will supplement the evaluation of the nature and extent of VOCs in the groundwater in the vicinity of the site. A second round of private well sampling will be conducted during the next field investigation at the site.

Offsite Bedrock Monitoring Well Installation

WSP Environmental Strategies installed two offsite bedrock groundwater monitoring wells, MW-9 and MW-10, on May 30 and 31, 2007, to characterize the groundwater quality offsite (Figure 2). Previously conducted downhole geophysical logging activities identified numerous sealed fractures and a few open to partially open fractures in all monitoring wells onsite. It was also concluded from the downhole logging results that there are two predominant fracture orientations; one low-angle set striking south and dipping gently to the west (likely bedding plane partings), and a second high-angle set striking north-northeast and dipping steeply to the south-southeast (likely joint sets). Based on optical televiewer logs, fractures associated with the high-angle fracture set are often truncated at bedding planes and commonly mineralized. The results of discrete groundwater sampling near the fractures indicate that the highest TCE and PCE concentrations are associated with the shallowest (55 to 65 feet bgs) open and partially open fractures below the water table.

Monitoring well MW-9 was installed southwest of onsite monitoring wells MW-3 and MW-5 on the American Legion property on Koffel Road along a fracture trace that extends in a northeast-southwest direction from the site. Monitoring well MW-10 was installed northwest of onsite monitoring well MW-6 in the public right-of-way at the southern end of Farview Avenue down dip of the shallow VOC-containing fractures identified onsite.

The well boreholes were installed using a truck-mounted air hammer drill rig. Split-spoon soil samples were collected to refusal (less than 5 feet bgs). Lithologic descriptions, which included soil color, texture, and moisture content, were recorded in the field book. Geologic logs with schematic well construction details are included in Enclosure B. The offsite wells remain as 8-inch diameter open boreholes. The total well depths are 128.5 feet bgs for MW-9 and 298 feet bgs in MW-10.

The groundwater levels were allowed to equilibrate in the boring for a period of 12 hours before continuing with well development. The equilibrated depth to water measured in the MW-9 borehole was approximately 55.2 feet bgs and 89.4 feet bgs in the MW-10 borehole. The open boreholes were developed using a Watterra® pump equipped with dedicated high-density polyethylene piping and a stainless-steel foot valve. Groundwater geochemical measurements (temperature, pH, and specific conductivity) and turbidity were periodically monitored during the development activities. Well pumping continued until the purge water was relatively free of suspended sediment and the field parameters had stabilized. The wells were secured with a locking expandable cap and protective steel valve box mounted flush with the surrounding grade.

The location and elevations of the reference mark and ground surface for MW-9 and MW-10 were surveyed by Urwiler and Walter, Inc., a Pennsylvania -licensed surveyor.

Well Logging Activities

On June 6, 2007, WSP Environmental Strategies and Mid-Atlantic Geosciences conducted a downhole geophysical survey in the open boreholes of each offsite monitoring well. The survey methods were the same as those used in onsite monitoring wells MW-1 through MW-8 which included logging of fluid temperature, fluid conductivity, natural gamma radiation, borehole diameter and surface structure using a three-arm caliper and optical/high resolution acoustic televiewer (OPTV/HRAT) imaging of the boreholes.

The purpose of the geophysical surveys was to locate potential open fracture zones where groundwater may be entering or exiting the borehole. The fluid probe measured changes in temperature and conductivity of the undisturbed water column in the well, which is often differentiated depending upon whether the water is relatively stagnant (i.e., adjacent to rock without any fractures) or there is an active exchange of groundwater through openings in the borehole wall. The three-arm caliper is a mechanical measurement of the borehole wall that will provide the average diameter and location of fractures along the borehole wall. The natural gamma radiation log is useful for identifying lithologic changes in the borehole and can be used for stratigraphic correlation between well locations.

Both the temperature/conductivity probe and caliper logs were verified by the OPTV/HRAT survey. The OPTV uses a downhole CCD camera equipped with a hyperbolic mirror to examine the borehole walls. Unlike a standard downhole television camera, the device uses successive image scans (0.5 millimeter in length) to build a continuous optical record that is ultimately transferred to a paper borehole log for analysis. In wells with low visibility (due to groundwater with a high particle load), the HRAT is substituted for the OPTV. The HRAT uses an acoustical signal to build a similar log of the borehole. Onboard magnetometers measure the orientation of

the OPTV/HRAT during its descent allowing the strike and dip of fractures or bedding planes to be measured directly from the output log.

The OPTV/HRAT survey allowed for a direct visual examination of the potential fracture zones identified by the logs and was used to determine the fracture abundance and their potential for transmitting groundwater. This information was used to select specific open or partially open fractures for collecting discrete interval groundwater samples. The fractures chosen for the discrete interval groundwater samples are shown in Table 1.

Discrete Interval Groundwater Sampling

Groundwater samples were collected from discrete fracture intervals within wells MW-9 and MW-10 on June 18 and 27, 2007. The discrete fracture groundwater sampling activities complied with the methods and procedures discussed in Section 7 of the EPA Region 4 *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual* (November 2001) and WSP Environmental Strategies' standard operating procedures. Before initiating the sampling activities, an electronic water level indicator was used to measure the depth to water in the monitoring wells and open boreholes. Based on their depth and orientation, partially open or open fractures identified in the well logs for the new offsite wells (Table 1) were selected for discrete interval groundwater sampling using low-flow purging and sampling techniques. Five groundwater samples were collected from MW-9 and seven samples were collected from MW-10. Groundwater wells and boreholes were purged for sampling using a low-flow purging technique with a QED SamplePro portable micropurge pump with dedicated bladder and tubing. Measurements of field hydrogeochemical parameters (pH, specific conductivity, dissolved oxygen, temperature, and oxidation-reduction potential) and turbidity were taken every 3 to 5 minutes using a YSI® 556 Multi-Parameter Handheld Meter with a flow-through cell. These parameters were allowed to stabilize before sample collection.

Groundwater samples were submitted to Phase Separation Sciences laboratory in Baltimore, Maryland, for analysis of TCE and PCE using EPA Test Method 8260B. The analytical results (Table 2) show that TCE and PCE were below the PADEP cleanup standard of 5 µg/l in both offsite wells. The data will be further evaluated to determine which fractures are potentially contributing groundwater containing TCE and/or PCE to the borehole and will be used in conjunction with the logging results to determine if a nested pair of 2-inch-diameter PVC wells should be installed in each borehole.

Installation of Nested Wells Onsite

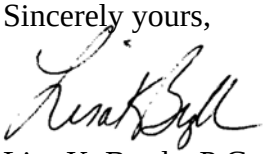
Nested well pairs were installed within onsite wells MW-4 through MW-8 to better isolate and sample the significant bedrock fractures in each well. Schedule 40 flush-threaded 2-inch ID PVC casings fitted with one or more 10-foot-long sections of 0.010-inch continuous wrap PVC screen were used to construct each nested pair. Table 3 lists the screened intervals in each well along with the associated fracture depths.

Additional Offsite Well

Based on the results of the private well sampling conducted at the trailer park located off Koffel Road, a third offsite monitoring well will be installed to assess the distribution of VOCs in groundwater further downgradient of the Brooks site. The well will be installed to a similar depth and construction as the current offsite monitoring wells. Based upon obtaining appropriate access authority from the land owner, it is anticipated that the well will be located along Koffel Road, near the trailer park, as shown in Figure 2 (MW-11).

If you have any questions regarding the investigations conducted to date, please feel free to contact Steve Clarke of Emerson at 314-553-1956 or me at 703-709-6500 at any time.

Sincerely yours,



Lisa K. Bryda, P.G.
Project Director

LKB:slp
K:\Emerson\BROOKS\Hatfield,PA\Act II Investigations\PADEP_LetterNov2007.doc

cc/encl.: Stephen L. Clarke, Emerson
Jennifer Giblin, Esquire, Pillsbury Winthrop Shaw Pittman LLP

Figures

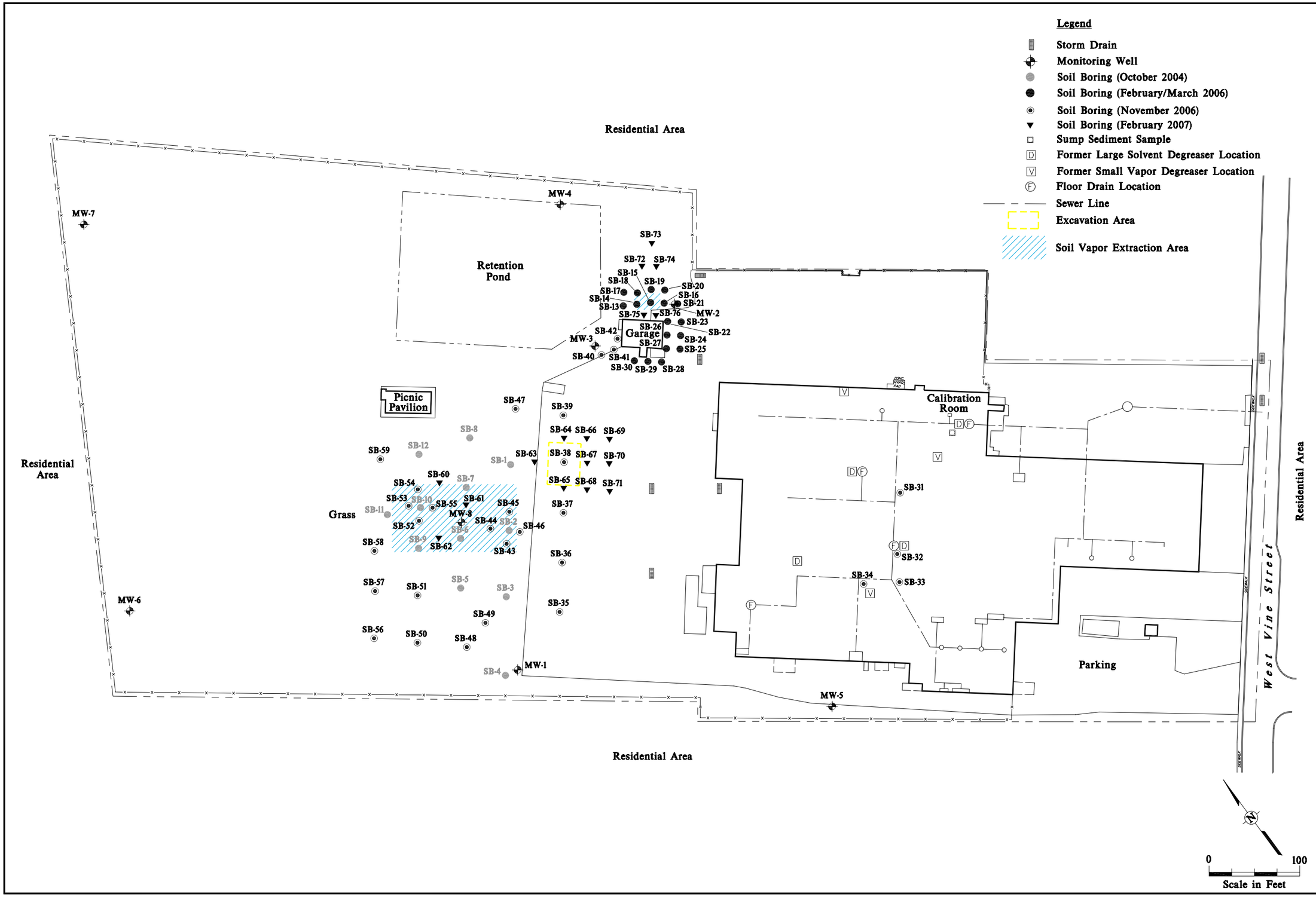
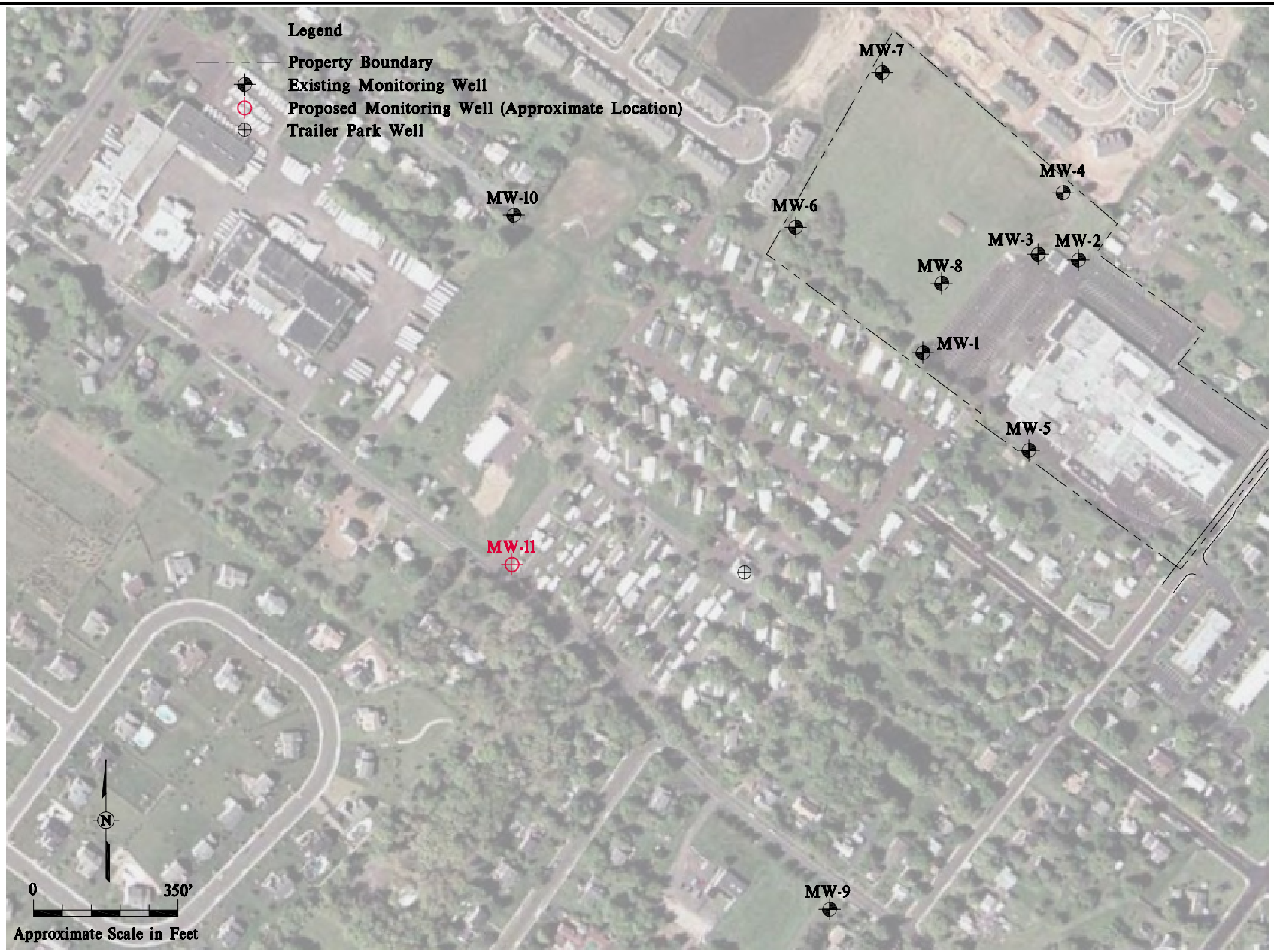


Figure 1
Excavation and Soil Vapor Extraction Areas
Brooks Instrument Facility
Hatfield, Pennsylvania

13107031.DWG

11911 Freedom Drive Suite 900
Reston, Virginia 20190
(703) 709-6500

WSP
Environmental Strategies



WSP
Environmental Strategies

11911 Freedom Drive Suite 900
Reston, Virginia 20190
(703) 709-6500

Figure 2
Offsite Monitoring Well Locations
Brooks Instrument Facility
Hatfield, Pennsylvania

13107044.DWG

Tables

Table 1

Fracture Intervals in Offsite Wells
Brooks Instrument
Hatfield, Pennsylvania

Well No.	Fracture Interval (a)	Pump Intake (b)
MW-9		
	70-73 feet	72 feet
	82-84 feet	83 feet
	105.5-107 feet	106 feet
	114-115.5 feet	115 feet
	123-125.5 feet	124.5 feet
MW-10		
	94-96 feet	95 feet
	119-121 feet	120 feet
	159-163 feet	161 feet
	180.5-183 feet	182 feet
	245-249 feet	247 feet
	256.5-257.5 feet	257 feet
	279.5-280.5 feet	280 feet

a/ Depth below casing of major fracture or fracture zone
b/ Depth below casing where sample was collected

Table 2

Groundwater Sample Results
MW-9 and MW-10 (ug/l)
Brooks Instrument Facility
Hatfield, Pennsylvania

	Depth (feet) (a)	TCE	PCE
MW-9	72	1	ND
	83	1	ND
	106	1	ND
	115	1	ND
	124.5	1	ND
MW-10	95	ND	2
	120	1	3
	161	1	2
	182	1	2
	247	ND	ND
	257	ND	1
	280	ND	ND

a/ Pump intake depth below top of casing.
TCE - trichloroethene
PCE - tetrachloroethene
ND - not detected

Table 3

Groundwater Monitoring Well Construction Information
Brooks Instrument Facility
Hatfield, Pennsylvania

Well ID	Top of Casing Elevation (ft aMSL)	TD (ft btoc)	DTW Measurement Date	DTW (ft btoc)	Groundwater Elevation (ft aMSL)	Screen Length (ft)	Top of Screened Interval (ft btoc)	Bottom of Screened Interval (ft btoc)	Outer Steel Casing Length (ft)
MW-1	348.71	NM	6/18/2007	56.25 (a)	292.46	NA - open	NA	NA	21
MW-2	345.29	NM	6/18/2007	NM (a,b)	NM	NA - open	NA	NA	21
MW-3	345.21	NM	6/18/2007	52.39 (a)	292.82	NA - open	NA	NA	22
MW-4D	341.75	125.61	6/18/2007	48.48	293.27	5.0	120.1	125.1	21
MW-4S	341.65	87.94	6/18/2007	48.49	293.16	15	72.4	87.4	21
MW-5D	346.81	119.79	6/18/2007	48.81	298	10	109.3	119.3	21.2
MW-5S	346.8	77.80	6/18/2007	48.5	298.3	20	57.3	77.3	21.2
MW-6D	344.18	95.17	6/18/2007	59.14	285.04	10	84.7	94.7	20.3
MW-6S	344.17	75.41	6/18/2007	59.11	285.06	10	64.9	74.9	20.3
MW-7D	339.07	94.88	6/18/2007	41.32	297.75	10	84.4	94.4	19.6
MW-7S	339.08	65.65	6/18/2007	39.47	299.61	10	55.2	65.2	19.6
MW-8D	348.69	105.22	6/18/2007	55.98	292.71	10	94.7	104.7	20.5
MW-8S	348.75	70.28	6/18/2007	55.89	292.86	15	54.8	69.8	20.5
MW-9	353.93	128.5	6/18/2007	55.44 (a)	298.49	NA - open	NA	NA	19
MW-10	350.48	298	6/18/2007	91.01 (a)	259.47	NA - open	NA	NA	20

a/ Measurements from steel casing - open borehole
b/ Well was pumping, no measurements collected

July 1, 2009

Ms. Jessica Kasmari
Geologic Specialist
ECP Special Projects
Pennsylvania Department of Environmental Protection
2 E. Main Street
Norristown, PA 19401

Re: Update on Brooks Instrument Facility, Hatfield, Pennsylvania

Dear Ms. Kasmari:

On behalf of Emerson, WSP Environment & Energy has prepared this letter summarizing the recent environmental investigations conducted at the Brooks Instrument facility in Hatfield, Pennsylvania, since November 2007. The activities included installing an offsite groundwater monitoring well, collecting and analyzing a second round of water samples from offsite private wells, groundwater sampling on select monitoring wells both on- and offsite, preparing a risk assessment for soil and groundwater, and conducting a soil investigation near well MW-5 (onsite). In addition, an update on the soil vapor extraction (SVE) system is included.

Offsite Monitoring Well

WSP installed one offsite bedrock groundwater monitoring well, MW-11, on May 28, 2008, to further delineate offsite groundwater quality downgradient of the Village Scene Manufactured Homes Community (Village Scene) wells (Figure 1). Split-spoon soil samples were initially collected to refusal at approximately 4 feet below ground surface (bgs). An air hammer drilling rig was then used to create a 10-inch diameter borehole to a depth of 21 feet bgs. An 8-inch inside diameter steel casing was grouted into place. After the grouted was allowed to cure, air hammer drilling continued through the casing to create an 8-inch borehole to a depth of 127 feet bgs. Lithologic descriptions, which included soil color, texture, and moisture content, were recorded in the field book, and a geologic log is included in Enclosure A. The offsite well remains as an 8-inch diameter open borehole.

The groundwater level was allowed to equilibrate in the boring for a period of 12 hours before continuing with well development. The open borehole was developed using a Watterra® pump equipped with dedicated high-density polyethylene piping and a stainless-steel foot valve. Groundwater geochemical measurements (temperature, pH, and specific conductivity) and turbidity were periodically monitored during the development activities. Well pumping continued until the purge water was relatively free of suspended sediment and the field parameters had stabilized. The well was secured with a locking expandable cap and protective steel valve box mounted flush with the surrounding grade.

On June 3, 2008, WSP and Mid-Atlantic Geosciences conducted a downhole geophysical survey in the open borehole for MW-11. The survey methods were the same as those used in onsite monitoring wells MW-1 through MW-8 which included logging of fluid temperature, fluid conductivity, natural gamma radiation, borehole diameter, and surface structure using a three-

WSP Environment & Energy
11190 Sunrise Valley Drive, Suite 300
Reston, VA 20191
Tel: (703) 709-6500
Fax: (703) 709-8505
www.wspenvironmental.com/usa

arm caliper and optical/high resolution acoustic televiewer (OPTV/HRAT) imaging of the borehole.

The purpose of the geophysical survey was to locate potential open fracture zones where groundwater may be entering or exiting the borehole. The fluid probe measured changes in temperature and conductivity of the undisturbed water column in the well, which is often differentiated depending upon whether the water is relatively stagnant (i.e., adjacent to rock without any fractures) or there is an active exchange of groundwater through openings in the borehole wall. The three-arm caliper is a mechanical measurement of the borehole wall that provides the average diameter and location of fractures along the borehole wall. The natural gamma radiation log is useful for identifying lithologic changes in the borehole and can be used for stratigraphic correlation between well locations.

Both the temperature/conductivity probe and caliper logs were verified by the OPTV/HRAT survey. The OPTV uses a downhole CCD camera equipped with a hyperbolic mirror to examine the borehole walls. Unlike a standard downhole television camera, the device uses successive image scans (0.5 millimeter in length) to build a continuous optical record that is ultimately transferred to a paper borehole log for analysis. In wells with low visibility (due to groundwater with a high particle load), the HRAT is substituted for the OPTV. The HRAT uses an acoustical signal to build a similar log of the borehole. Onboard magnetometers measure the orientation of the OPTV/HRAT during its descent allowing the strike and dip of fractures or bedding planes to be measured directly from the output log.

The OPTV/HRAT survey allowed for a direct visual examination of the potential fracture zones identified by the logs and was used to determine the fracture abundance and their potential for transmitting groundwater. This information was used to select specific open or partially open fractures for collecting discrete interval groundwater samples. The fractures in well MW-11 chosen for discrete interval groundwater sampling are at the following depths: 67 feet, 73.5 feet, 87 feet, and 115 feet.

The location and elevations of the reference mark and ground surface for MW-11 were surveyed by Urwiler and Walter, Inc., a Pennsylvania -licensed surveyor. A summary of all groundwater monitoring well construction and survey information is included in Table 1.

Groundwater samples were collected from well MW-11 in June 2008 using the low-flow technique. The samples were analyzed for VOCs at Phase Separation Sciences laboratory in Baltimore, Maryland, using U.S. EPA Method 8260B, and none were detected in any of the samples. The sample depths are listed above.

Private Well Sampling

In June 2008, WSP collected a second round of water samples from six private wells that were accessible and where the owner gave permission to sample, within approximately 0.75 mile of the Brooks site (Figure 2). In addition, during the 2008 sampling event, two additional wells were identified on the Village Scene property. One is located outside the woodshed (Figure 2) and is connected to a holding tank inside the woodshed and the water is kept for potential fire suppression purposes. According to the owners, this well has not been used in several years. Access to the well for sampling was not possible due to the existence of a pump and piping to the holding tank. The second additional well is located inside the wood shed adjacent to the

holding tank. The owners reported that this well also has not been used in many years; however, it was possible to collect a water sample from the well.

All private well sample results, except for the Village Scene wells, contained less than 2 micrograms per liter (μg/l) trichloroethene (TCE) or tetrachloroethene (PCE). The two wells that are used for drinking water (Table 2) contained less than 0.5 μg/l of TCE and less than 2 μg/l of PCE, both of which are well below the human health protection standards for drinking water of 5 μg/l, as established by the PADEP and the EPA for both chemicals. The groundwater sample collected from the holding tank connected to the main well at the Village Scene Park contained 41 μg/l of TCE and 4.1 μg/l of PCE. The water from this well is only used for washing cars in the Village Scene Community. The second well located inside the wood shop in the Village Scene Community contained 2.3 μg/l of TCE and 11 μg/l of PCE. All results are comparable to those obtained in June 2007 and were reported to the well owners and the PADEP via individual letters.

Groundwater Sampling Results

Groundwater samples have been collected from discrete fracture intervals within onsite and offsite wells between since 2005. Starting in November 2005, groundwater samples were collected quarterly from wells MW-1, MW-2, and MW-3. Beginning in September 2006, samples were also collected during some of the quarterly events from wells MW-1 through MW-8. Starting in June 2007, wells MW-9 and MW-10 were added to the sampling scheme and in June 2008, well MW-11 was added. The discrete fracture groundwater sampling activities complied with the methods and procedures discussed in Section 7 of the EPA Region 4 Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (November 2001) and WSP's standard operating procedures. Before initiating the sampling activities, an electronic water level indicator was used to measure the depth to water in the monitoring wells and open boreholes. Based on their depth and orientation, partially open or open fractures identified in the well logs for the wells were selected for discrete interval groundwater sampling using low-flow purging and sampling techniques. The groundwater wells and boreholes were purged for sampling using a low-flow purging technique with a QED SamplePro portable micropurge pump with dedicated bladder and tubing. Measurements of field hydrogeochemical parameters (pH, specific conductivity, dissolved oxygen, temperature, and oxidation-reduction potential) and turbidity were taken every 3 to 5 minutes using a YSI® 556 Multi-Parameter Handheld Meter with a flow-through cell. These parameters were allowed to stabilize before sample collection.

The groundwater samples were submitted to Phase Separation Sciences laboratory in Baltimore, Maryland, for analysis of TCE and PCE using EPA Test Method 8260B. However, in November 2005, and March and June 2006, samples from wells MW-1 through MW-3 were analyzed for the complete list of VOCs using EPA Test Method 8260B. The analytical results for all wells sampled between 2005 and 2009 are included in Table 3, 4, and 5.

Groundwater Potentiometric Surface Map

Groundwater levels have been collected quarterly from most monitoring wells and are included in Table 6. A groundwater potentiometric surface map was constructed using depth to water data collected from both onsite (deep) and offsite wells in June 2008 (Figure 3). As shown in the figure, the current pumping well (MW-2) is capturing groundwater in the bedrock fractures beneath the site as far as wells MW-1, MW-8, MW-4, and MW-5. In order to better capture groundwater near the property boundary, an additional recovery well is planned along the western border of the site between well pair MW-5 and well MW-1.

Risk Assessment

Current and future potential risks were evaluated for both onsite (facility workers) and offsite (residential child and adult) receptors in accordance with PADEP Act 2 guidance. For the onsite receptor, the potential risk associated with the current and future exposure to TCE or PCE in groundwater via vapor intrusion was determined by using the Johnson and Ettinger (JE) model. The depth to groundwater was conservatively assumed to be the interface between the unconsolidated material and bedrock (due to JE model assumptions) and the exposure point concentration used was the concentration at MW-5. At a groundwater depth of 10 feet bgs, no unacceptable potential risks were estimated. Actual depth to groundwater at the site is approximately 50 feet bgs, thus, the analysis was conservative.

For the offsite receptors in the current scenario, the potentially complete exposure pathways evaluated were dermal contact with, and accidental ingestion of, water from the Village Scene well during either car washing activities (residential adult) or bathing in a baby pool (residential child), and inhalation of vapors in a residential building. The JE model was used to estimate the concentration of chemicals of concern (COCs) in household indoor air. Due to the limitations of modeling vapor attenuation and intrusion through bedrock, as a conservative measure the depth to groundwater was assumed to be the interface between the unconsolidated material and bedrock zone at 10 feet bgs. Additionally, a slab-on-grade construction of the JE model was also used, which is a conservative measure as the manufactured homes typically have a crawl space beneath the home that would decrease potential concentrations of COCs in the air due to dispersion. No unacceptable potential risks were identified for either the residential child or the residential adult in the current scenario.

There currently is no restriction on the installation of a private water supply well in the Borough of Hatfield; therefore, the future potentially complete exposure pathways of ingestion of tap water, dermal contact while showering or bathing, and inhalation of shower vapors and/or indoor air were evaluated for both the residential adult and child. As a conservative measure, the concentrations in MW-5 were used as the exposure point concentration. There was an unacceptable potential risk estimated for both the residential adult and child, which is driven by the ingestion of tap water exposure pathway.

Soil Investigation near MW-5

To investigate a potential source for the VOCs in well pair MW-5, shallow soil borings were installed along the western portion of the property between the main building and well pair MW-5. On December 16, 2008, eight soil borings were installed using the hydraulically-driven direct push technique to collect soil samples for analysis of TCE and PCE. The borings were labeled SB-75 through SB-82 (Figure 4). All soil samples collected from the borings were screened with

a PID. The PID results and lithologic descriptions were recorded in the field logbook. The depths of the borings ranged from 3.5 feet to 8 feet bgs where refusal at the bedrock interface was encountered. The boring logs are included in Enclosure A.

Soil samples were collected from each boring based on the PID results. The soil samples with the highest PID reading were submitted to Phase Separation Sciences Laboratory in Baltimore, Maryland, for analysis of VOCs using U.S. EPA Method 8260B. Table 7 lists the analytical results for the eight soil samples collected from either 2 to 4 feet or 4 to 6 feet bgs. Soil borings SB-77 and SB-80 were the only two borings that contained samples with VOCs at concentrations above the PADEP medium-specific concentration standard for residential and industrial soil to groundwater in a used aquifer area. The VOCs with the highest concentrations were TCE (35,000 μg/kg at 4 to 6 feet), vinyl chloride (360 μg/kg at 2 to 4 feet), and cis-1,2-dichloroethene (10,000 μg/kg at 4 to 6 feet) (Table 6).

Further investigations are planned to delineate the VOCs detected in the soil samples from this area, specifically east of former boring SB-80 near the aboveground air storage tank. In addition, historical aerial photographs will be reviewed to evaluate building expansion dates and former activities conducted in this area.

As a follow-up to a site meeting conducted on April 21, 2009, J.P. Kumar, consultant to the U.S. EPA requested analytical results for all soil samples collected at the site. To comply with this request WSP compiled the soil sample results. Enclosure B includes tables summarizing all soil boring data collected to date (except the December 2008 table which is discussed above). The soil investigations that have been conducted are:

- In October 2004, 12 borings were installed in the grassy area west of the garage (SB-1 through SB-12).

- A second soil investigation, which consisted of 18 borings(SB-13 to SB-30) was conducted in February 2006 in the area of the former tank removal action near the garage.

- A third soil investigation was conducted in November 2006 and included installing 25 soil borings (SB-35 through SB-59) on a 50-foot grid spacing, expanding upon the previous boring investigation in the grassy area west of the garage.

- Also in November 2006, three additional soil borings (SB-31 to SB-33) were installed inside the building adjacent to the sewer line in areas where former TCE degreasers were located.

- In February 2007, the grid was expanded near the garage and in the parking lot adjacent to the grassy area and 15 additional borings were installed (SB-60 through SB-74).

A figure showing all soil boring locations is also included in Enclosure B.

Soil Vapor Extraction System

The SVE system has been operating since November 2007. A schematic drawing showing the location of piping, extraction wells, vent wells, and shed for the system is shown in Figure 5. In the spring of 2008, it was found that water was accumulating in the extraction wells, particularly during and following heavy precipitation events. The water was periodically pumped from the wells during operation and maintenance events; however, this was found to be a temporary solution.

To optimize vapor extraction from the SVE wells, pneumatic pumps will be installed in four of the extraction wells to remove accumulated water and ensure the maximum amount of open screened interval within the wells. The following wells were selected based on results from short term pumping tests conducted in December 2008 and March 2009: SVE-1, SVE-2, SVE-7, and SVE-8. In addition, these wells are located in the area with the highest concentrations of VOCs detected in soil samples collected in November 2006.

On November 10, 2007, a grab sample was collected from the vapor stream after the air water separator and before the skid dilution valve. The air sample was analyzed for VOCs using EPA Method TO-15, by Centek Laboratories in Syracuse, New York. The total VOC concentration was 696,616 micograms per cubic meter ($\mu g/m^3$). Three constituents (Freon 113, PCE, and TCE) had concentrations over 150,000 $\mu g/m^3$. The concentrations of cis-1,2-dichloroethene, ethylbenzene, and m&p-xylenes were greater than 5,000 $\mu g/m^3$ (ranging from 8,230 to 20,300 $\mu g/m^3$). To double-check this elevated reading, additional air samples were collected on December 19, 2007, from both before the dilution valve and after the dilution valve. The total VOC concentrations in these samples ranged from 778 to 1,205 $\mu g/m^3$. Freon 113, PCE, and TCE were the primary VOCs in the sample. Another sample was collected after the dilution valve in May 2008 and had a concentration of 1,359 $\mu g/m^3$ total VOCs. Air samples were collected on in March 2009 from both before the dilution valve and after the dilution valve and had the following results: 1,189 $\mu g/m^3$ and 846 $\mu g/m^3$ total VOCs, respectively. It appears that the elevated concentrations detected during the initial sampling event were due to a spike upon startup of the SVE system.

Groundwater Remediation System

Groundwater has been pumped from well MW-2 and formerly from MW-3 since 1981. Pumped water is routed to an air stripper for treatment and subsequently discharged to an onsite storm water retention pond. The discharge is regulated by a National Pollutant Discharge Elimination System permit. The permit requires the collection of monthly water samples from the discharge point and analysis for TCE, PCE, and pH. In addition, the permit requires quarterly groundwater samples be collected from wells MW-1, MW-2, and MW-3 quarterly and the samples are to be analyzed for TCE and PCE. All results are submitted to the PADEP. In addition, annual groundwater monitoring reports are prepared and submitted to the PADEP summarizing the data collected throughout the year and providing an evaluation of the treatment system.

Groundwater is pumped at an average rate of approximately 7 gallons per minute from well MW-2. Concentrations of TCE and PCE have decreased dramatically throughout the 28 years of operation. Overall, the groundwater treatment system continues to operate as designed to reduce VOC concentrations at the site and capture groundwater to reduce the potential migration offsite. As stated above, an additional recovery well is planned along the western

border of the site between well pair MW-5 and well MW-1 to further impede offsite migration of affected groundwater.

Information from the investigation and remediation update letters that have been provided to the PADEP in January 2007, November 2007, and the current letter along with any further activities conducted at the site will be compiled into a Site Characterization Report as part of Emerson's overall Act 2 activities.

Emerson is continuing to pursue cleanup of the former Brooks property under the Act 2 program. If you have any questions regarding this update, please contact me at 703-709-6500 or Steve Clarke of Emerson at 314-553-1953.

Sincerely yours,

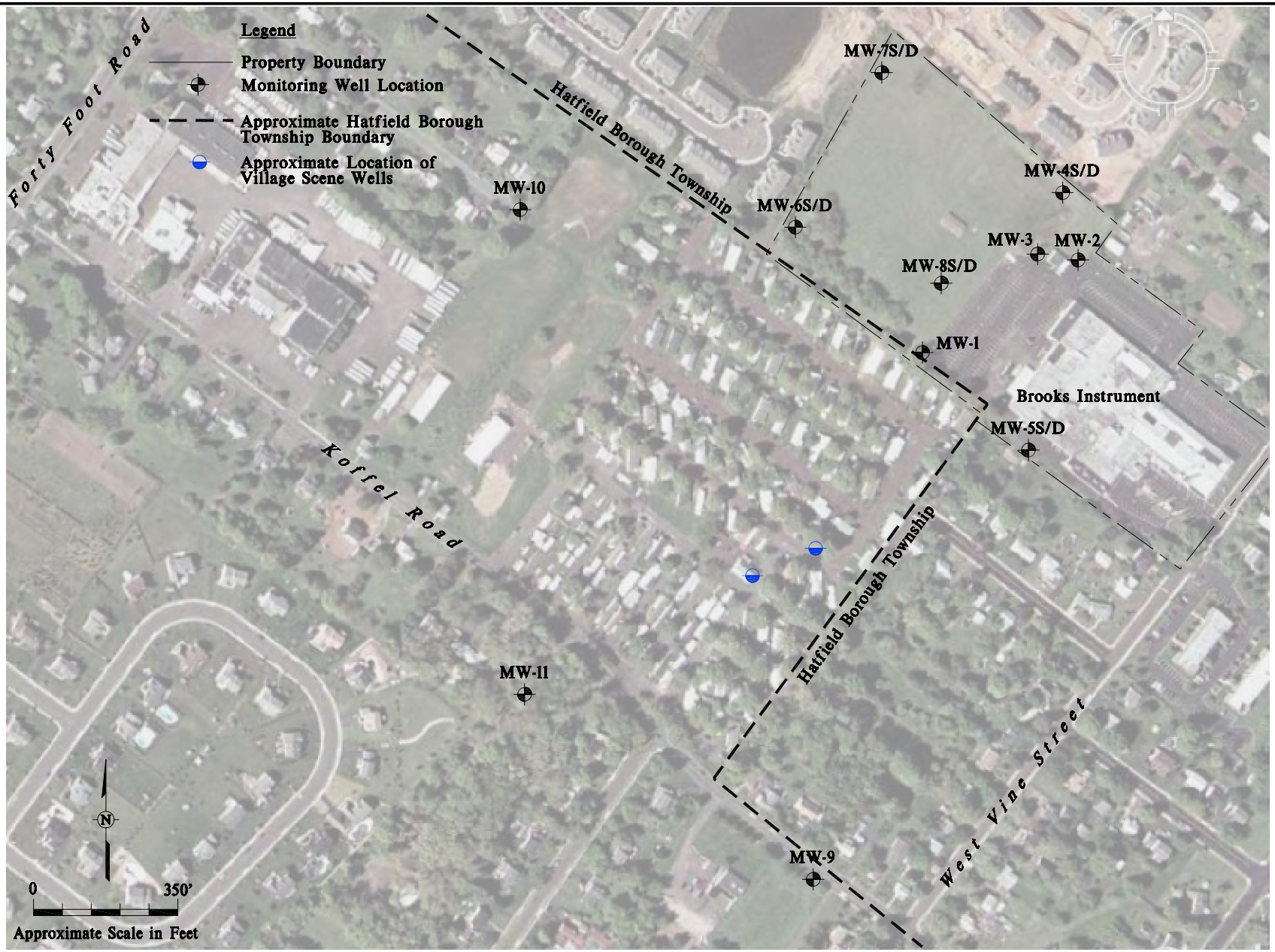
Lisa K. Bryda, P.G.
Project Director

LKB:bdw
k:\emerson\brooks\hatfield, pa\Brooks_131070\Task 06_Act 2 Investigations\2_Correspondence\Outgoing\131070_090701LBLET_Brooks_PADEP Update.doc

Enclosures

cc/encl.: Stephen L. Clarke, Emerson
Griff Miller, U.S. Environmental Protection Agency
J. P. Kumar, Michael Baker, Jr., Inc. (VIA electronic copy)
Kevin Gallagher, Brooks Instrument

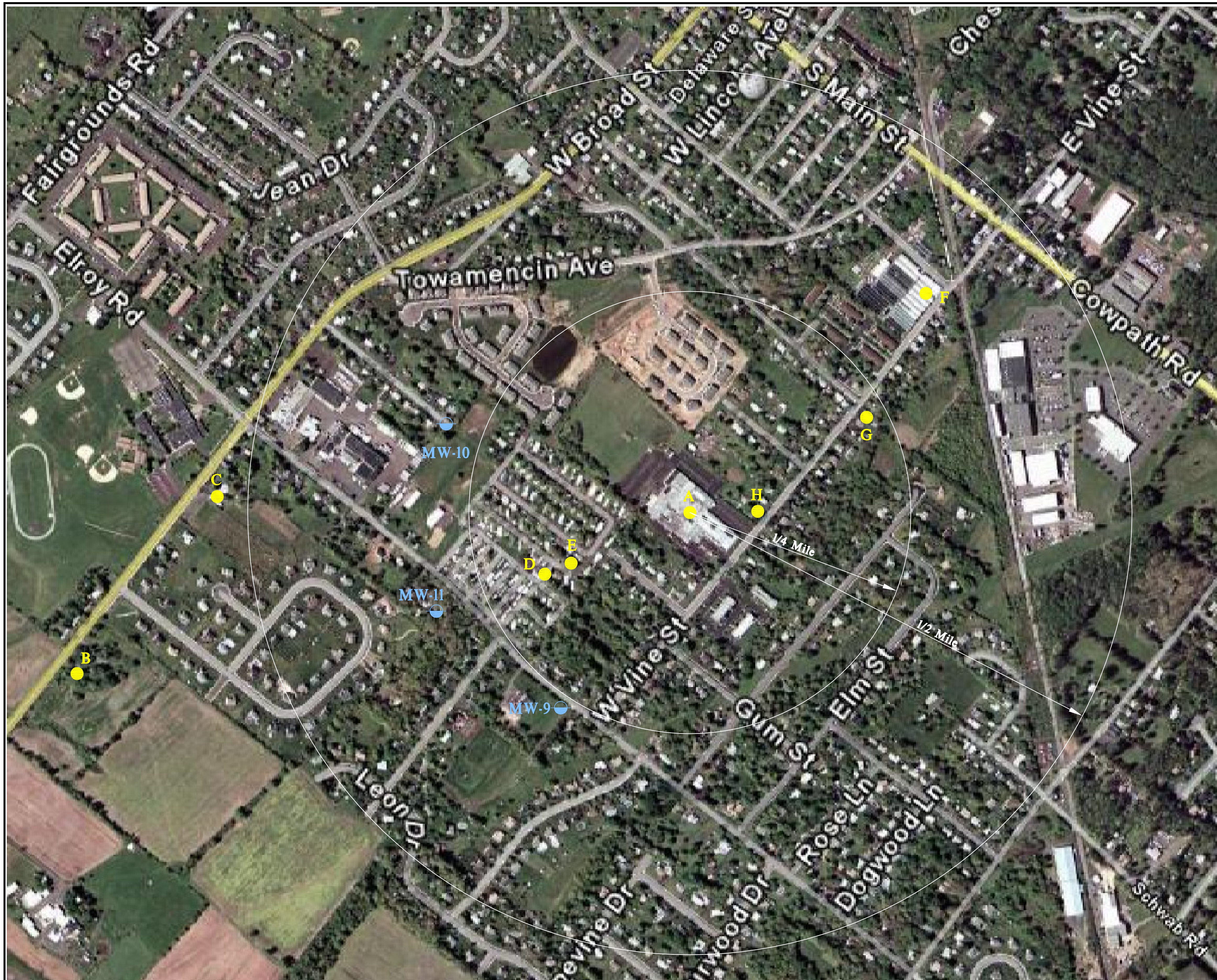
Figures



WSP Environment & Energy
11190 Sunrise Valley Drive Suite 300
Reston, Virginia 20191
(703) 709-6500

Figure 1
Site Layout and Monitoring Well Locations
Brooks Instrument Facility
Hatfield, Pennsylvania

13107061.DWG



Legend

A Brooks Instrument

Downgradient Wells

B 491 Forty Foot Road
C 755 Forty Foot Road
D 2151 Koffel Road (Village Scene)
E 2151 Koffel Road (Village Scene) Wood Shed)

Upgradient Wells

F 57 West Vine Street (Greenhouse)
G 220 West Vine Street
H 375 West Vine Street

Offsite Monitoring Well Location

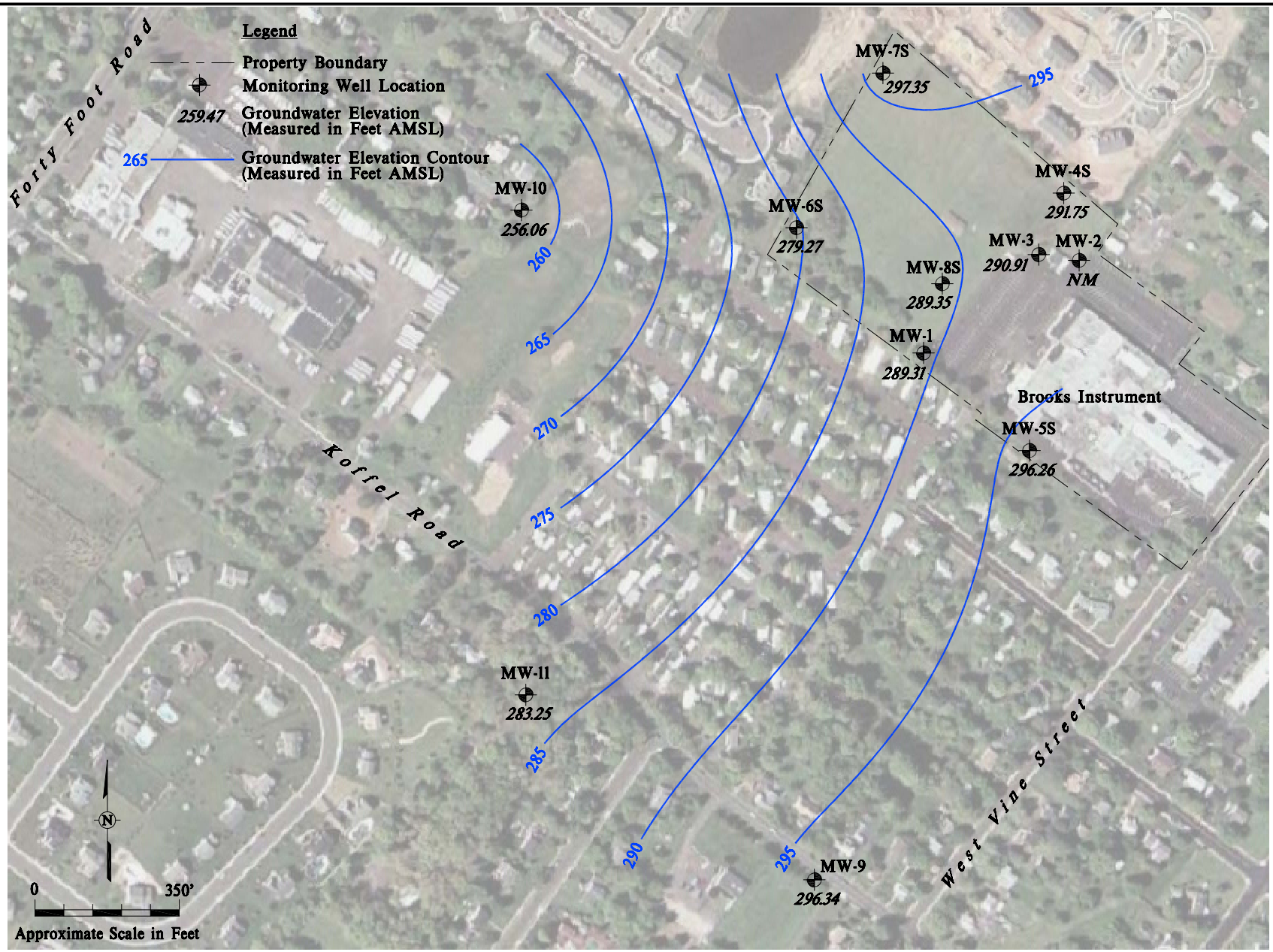
0 600
Scale in Feet

WSP

WSP Environment & Energy
11190 Sunrise Valley Drive Suite 300
Reston, Virginia 20191
(703) 709-6500

Figure 2
Private Well and Offsite Monitoring Well Locations
Brooks Instrument
Hatfield, Pennsylvania

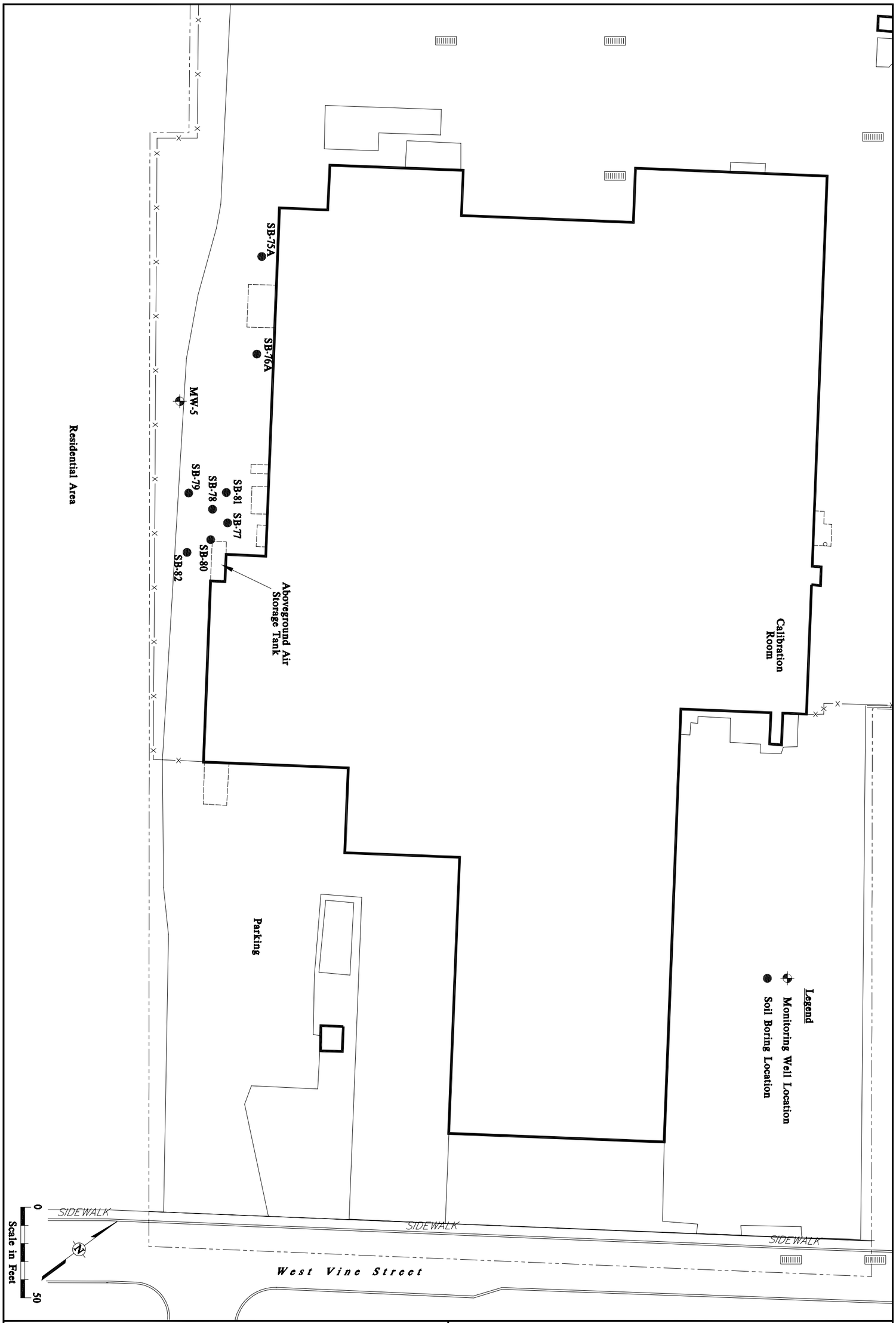
1310707.3.DWG



WSP Environment & Energy
11190 Sunrise Valley Drive Suite 300
Reston, Virginia 20191
(703) 709-6500

Figure 3
Groundwater Potentiometric Surface Elevation - June 18, 2008
Brooks Instrument Facility
Hatfield, Pennsylvania

13107063.DWG



WSP Environment & Energy
11190 Sunrise Valley Drive Suite 300
Reston, Virginia 20191
(703) 709-6500

Figure 4
December 2008 Soil Boring Locations
Brooks Instrument Facility
Hatfield, Pennsylvania

13107072.DWG

Retention Pond

Existing Air Stripper Equipment

Garage

Picnic Pavilion

Grass

Parking Area

Facility

Header
Flow Control Valve
Sample Port
Pressure/Vacuum Relief Valve
Extraction Well
SVE

Typical Well Schematic

Legend
- Storm Drain
- Monitoring Well
- Soil Boring (October 2004)
- Soil Boring (February/March 2006)
- Soil Boring (November 2006)
- Extraction Well
- Vent Well
- Cleanout Location
- Approximate Excavation Area

SB-17 SB-18 SB-19 SB-20 SVE-9 SVE-10 SB-15 MW-2 SB-21 SB-13 SB-14 VW-5 SB-16 SB-22 SB-23 SB-42 SB-26 SB-24 MW-3 SB-27 SB-25 SB-40 SB-41 SB-30 SB-29 SB-28 SB-47 SB-39 SB-8 SB-12 SB-59 SB-1 SB-38 SB-37 SB-36 SB-54 SB-7 SB-53 SB-10 SB-55 SB-11 SB-45 SB-44 SB-2 SB-46 SB-58 SB-9 SB-43 SB-6

SVE-3 TMP-4 SVE-5 TMP-3 VW-1 VW-3 TMP-1 TMP-2 SVE-2 SVE-1 SVE-7 VW-2 VW-4 MW-8 SVE-4 SVE-6 SVE-8

90° Bend

Note: All Inlet and Outlet Piping Will be Routed Through the Existing Hole in the Northern Wall of the Garage.

0 40'
Scale in Feet

Figure 5
SVE Extraction and Vent Well Layout - As-Built (October 2007)
Brooks Instrument Facility
Hatfield, Pennsylvania

13107052.DWG

WSP Environment & Energy
11190 Sunrise Valley Drive Suite 300
Reston, Virginia 20191
(703) 709-6500

WSP

Tables

Table 1

Monitoring Well Construction Information
Brooks Instrument Site
Hatfield, Pennsylvania

Well ID	Easting (ft)	Northing (ft)	Top of Casing Elevation (ft aMSL)	Total Depth (ft btoc)	Screen Length (ft)	Top of Screened Interval (ft btoc)	Bottom of Screened Interval (ft btoc)	Outer Steel Casing Length (ft)
MW-1	2,651,559.05	351,226.84	348.71	NM (a)	NA - open	NA	NA	21
MW-2	2,651,936.48	351,451.70	345.29	NM	NA - open	NA	NA	21
MW-3	2,651,838.41	351,465.92	345.21	NM	NA - open	NA	NA	22
MW-4D	2,651,899.11	351,614.98	341.75	125.61	5.0	120.1	125.1	20
MW-4S	2,651,899.11	351,614.98	341.65	87.94	15	72.4	87.4	20
MW-5D	2,651,816.07	350,990.26	346.81	119.79	10	109.3	119.3	21.2
MW-5S	2,651,816.07	350,990.26	346.8	77.80	20	57.3	77.3	21.2
MW-6D	2,651,250.83	351,531.22	344.18	95.17	10	84.7	94.7	20.3
MW-6S	2,651,250.83	351,531.22	344.17	75.41	10	64.9	74.9	20.3
MW-7D	2,651,460.61	351,906.15	339.07	94.88	10	84.4	94.4	19.6
MW-7S	2,651,460.61	351,906.15	339.08	65.65	10	55.2	65.2	19.6
MW-8D	2,651,604.58	351,395.16	348.69	105.22	10	94.7	104.7	20.5
MW-8S	2,651,604.58	351,395.16	348.75	70.28	15	54.8	69.8	20.5
MW-9	2,651,297.02	349,947.36	353.93	128.5	NA - open	NA	NA	19
MW-10	2,650,582.14	351,571.09	350.48	298	NA - open	NA	NA	20
MW-11	2,650,595.80	350,394.61	348.27	125	NA - open	NA	NA	20.8

a/ NM - not measured
NA - not applicable
ft - feet
btoc - below top of casing
aMSL - above mean sea level

Table 2

Private Water Well Survey
Brooks Instrument Facility
Hatfield, Pennyslvania

Address	Distance from Site	Well Use	Well Depth	Date Installed	On City Water Now
Downgradient					
491 Forty Foot Road	0.75 mi	domestic	unknown	unknown	no
755 Forty Foot Road	0.6 mi	domestic/irrigation	200 feet	1950s	yes
2151 Koffel Road (Village Scene) (located near main office)	< 0.25 mi	Car Washing	unknown	1955	yes
2151 Koffel Road (Village Scene) (located in wood shop)	< 0.25 mi	No Used	unknown	1955	yes
Upgradient					
57 W. Vine Street (Greenhouse)	0.25 mi	irrigation/bathrooms	400 feet	1990-1995	yes
220 W. Vine Street	0.25 mi	irrigation	unknown	unknown	yes
375 W. Vine Street	< 0.25 mi	irrigation	30 feet	unknown	yes

Table 3

Groundwater Sample Results
Volatile Organic Compounds (a)
Brooks Instrument Facility
Hatfield, PA

Sample ID:	**MW-1-0590**	**MW-1-700**	**MW-1-0700**	**MW-1-840**	**MW-1-980**	**MW-1-0975**	**MW-1-0980**	**MW-1-1055**	**MW-1-1120**
Date	**Mar-06**	**Nov-05**	**Jun-06**	**Nov-05**	**Nov-05**	**Mar-06**	**Jun-06**	**Nov-05**	**Nov-05**
Depth (feet below top of casing):	**59**	**69 - 71** (b)	**70**	**83 - 85** (b)	**97 - 99** (b)	**97.5**	**98**	**104.5 - 106.5** (b)	**111 - 113** (b)
Acetone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	1 U	1 U	NA	1 U	1 U	1 U	NA	1 U	1 U
cis-1,2-Dichloroethene	1 U	2.4	NA	2.6	2.3	1	NA	2.4	2.5
1,1,1-Trichloroethane	1 U	1 U	NA	1 U	1 U	1 U	NA	1 U	1 U
1,1,2-Trichloro-1,2,2-trifluoroethane	45	14	NA	15	16	7	NA	15	16
Tetrachloroethene	6	13	7	14	14	4	5	13	14
Trichloroethene	2	1.6	2	1.8	1.7	1	1	2.4	2.2

Sample ID:	**MW-2-625**	**MW-2-0680**	**MW-2-775**	**MW-2-0780**	**MW-2-865**	**MW-2-945**	**MW-2-945**	**MW-2-1010**	**MW-2-1140**	**MW-2-1255**	**MW-2-1260**
Date	**Nov-05**	**Mar-06**	**Nov-05**	**Mar-06**	**Nov-05**	**Nov-05**	**Mar-06**	**Nov-05**	**Nov-05**	**Nov-05**	**Mar-06**
Depth (feet below top of casing):	**61.5 - 63.5** (b)	**63**	**76.5 - 78.5** (b)	**78**	**85.5 - 87.5** (b)	**93.5 - 95.5** (b)	**94**	**100 - 102** (b)	**113 - 115**	**124.5 - 126.5**	**126**
Acetone	5 U	68	5 U		5 U	5/5 U(c)	5 U	5/5 U(c)	5 U	5 U	5 U
1,1-Dichloroethene	6.8	1 U	1 U	1 U	1 U	1/1 U(c)	1 U	1/1 U(c)	1 U	1 U	1.0 U
cis-1,2-Dichloroethene	52	12	10	7	10	10/10 (c)	6	10/11 (c)	10	11	7
1,1,1-Trichloroethane	1.1	1 U	1 U	1 U	1 U	1/1 U(c)	1 U	1/1 U(c)	1 U	1 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane	880 D	390	150 D	160	150 D	130/120 D(c)	130	100/120 D(c)	120 D	120 D	120
Tetrachloroethene	50	28	31	24	29	30/28 (c)	19	29/30 (c)	29	31	16
Trichloroethene	670 D	59	82	25	61	65/63 (c)	22	62/66 (c)	67	72	24

Sample ID:	**MW-3-0540**	**MW-3-0540**	**MW-3-600**	**MW-3-850**	**MW-3-1110**	**MW-3-1310**	**MW-3-1400**	**MW-3-1465**	**MW-3-1460**	**MW-3-1465**	**MW-3-1600**	**MW-3-1785**
Date	**Mar-06**	**Jun-06**	**Nov-05**	**Nov-05**	**Nov-05**	**Nov-05**	**Nov-05**	**Nov-05**	**Mar-06**	**Jun-06**	**Nov-05**	**Nov-05**
Depth (feet below top of casing):	**54**	**54**	**59-61** (b)	**84-86** (b)	**110 - 112** (b)	**130 - 132** (b)	**139 - 141** (b)	**145.5 - 147.5** (b)	**146**	**146**	**159 - 161** (b)	**177.5 - 179.5** (b)
Acetone	5 U	5 U	5 U	6.3	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
cis-1,2-Dichloroethene	6	NA	6.4	6.2	6.4	5.9	6.2	6.2	5	NA	6.4	5.9
1,1,1-Trichloroethane	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
1,1,2-Trichloro-1,2,2-trifluoroethane	1 U	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	1 U	1 U
Tetrachloroethene	2	1 U	1.3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	180	25	44	21	29	24	33	31	15	16	46	28

Sample ID:	**MW-3-1980**	**MW-3-1980**	**MW-3-1980**	**MW-3-2110**	**MW-3-2270**	**MW-3-2375**	**MW-3-2380**	**MW-3-2375**	**MW-3-2620**	**MW-3-2900**	**MW-3-3025**
Date	**Nov-05**	**Mar-06**	**Jun-06**	**Nov-05**	**Nov-05**	**Nov-05**	**Mar-06**	**Jun-06**	**Nov-05**	**Nov-05**	**301.5 - 303.5**
Depth (feet below top of casing):	**197 - 199** (b)	**198**	**198**	**210 - 212** (b)	**226 - 228** (b)	**236.5 - 238.5** (b)	**238**	**237.5**	**261 - 263** (b)	**289 - 291** (b)	**Nov-05** (b)
Acetone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5/5 U(c)	5 U	5 U	5 U
1,1-Dichloroethene	1 U	1 U	NA	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U
cis-1,2-Dichloroethene	6.3	5	NA	6	5.8	6	4	NA	6	6.3	6
1,1,1-Trichloroethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-trifluoroethane	1 U	1 U	NA	1 U	1 U	1 U	1 U	NA	1 U	1 U	1 U
Tetrachloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1/1 U(c)	1 U	1 U	1 U
Trichloroethene	24	15	15	19	17	13	7	9/3 (c)	10	9.5	8.7

a/ U - not detected above the reporting limit D - diluted sample result NA - not analyzed
b/ Samples were collected using passive diffusive bag samplers in November 2005; all others were collected using low flow techniques
c/ Duplicate Sample

Table 4

Quarterly Groundwater Sample Results for Trichloroethene (ug/l) (a)
November 2005 - March 2009
Brooks Instrument Facility
Hatfield, Pennsylvania

	Nov-05	Mar-06	Jun-06	Sep-06	Dec-06	Apr-07	Jun-07	Sep-07	Dec-07	Mar-08	Jun-08	Sep-08	Dec-08	Mar-09
MW-1														
59 feet	NS	2	NS	2	4	2	2	NS	NS	NS	NS	NS	NS	NS
70 feet	1.6	NS	2	1/2 (b)	2	1	NS	2	1/3 (b)	1/1 U (b)	1 U	1 U	1 U	1 U
84 feet	1.8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
98 feet	1.7	1	1	1	2	1	1	2	1	1 U	1 U	1 U	1 U	1 U
105.5	2.4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
112	2.2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-2														
Influent	NS (c)	NS (c	NS (c)	NS (c)	37/36 (b)	32	24	27	(d)	20	18	20	21	16
62.5 feet	670 D	59	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
77.5 feet	82	25	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
86.5 feet	61	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
94.5 feet	65/63 (b)	22	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
101 feet	62/63 (b)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
114 feet	67	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
125.5 feet	72	24	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-3														
54.5 feet	NS	180	25	56	1,300 E	840	44	NS	NS	NS	NS	NS	NS	NS
60 feet	44	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	60	3	2
85 feet	21	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
111 feet	29	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
131 feet	24	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
140 feet	33	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
146.5 feet	31	15	16	4	48	35/58 (b)	2	1/1 (b)	3	4	8	NS	1	1
160 feet	46	NS	NS	NS	54	44	3	1	4	2	2	2	NS	1 U
178.5 feet	28	NS	NS	NS (e)	NS (e)	NS (e)	NS (e)	NS (e)	NS (e)	NS (e)	NS (e)	NS (e)	NS (e)	NS (e)
198 feet	24	15	15	--	--	--	--	--	--	--	--	--	--	--
211 feet	19	NS	NS	--	--	--	--	--	--	--	--	--	--	--
227 feet	17	NS	NS	--	--	--	--	--	--	--	--	--	--	--
237.5 feet	13	7	9/3 (b)	--	--	--	--	--	--	--	--	--	--	--
262 feet	10	NS	NS	--	--	--	--	--	--	--	--	--	--	--
290 feet	9.5	NS	NS	--	--	--	--	--	--	--	--	--	--	--
302.5 feet	8.7	NS	NS	--	--	--	--	--	--	--	--	--	--	--
MW-4														
61 feet	NI	NI	NI	11/9 (b)	3/3 (b)	NS	NS	NS	NS	NS	NS	NS	1 U	NS
80.5 feet	NI	NI	NI	3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
82.5 feet	NI	NI	NI	NS	2	NS	1/1 U (b)	NS	NS	NS	1 U	1 U	NS	NS
120.5 feet	NI	NI	NI	2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
123 feet	NI	NI	NI	NS	3	NS	1	NS	NS	NS	1	1/2 (b)	NS	NS

Table 4

Quarterly Groundwater Sample Results for Trichloroethene (ug/l) (a)
November 2005 - March 2009
Brooks Instrument Facility
Hatfield, Pennsylvania

	Nov-05	Mar-06	Jun-06	Sep-06	Dec-06	Apr-07	Jun-07	Sep-07	Dec-07	Mar-08	Jun-08	Sep-08	Dec-08	Mar-09
MW-5														
58 feet	NI	NI	NI	270/280 (b)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
59 feet	NI	NI	NI	NS	360	NS	250	NS	NS	NS	240	200	180	NS
64 feet	NI	NI	NI	NS	370	NS	220/230	NS	NS	NS	220	NS	NS	NS
65 feet	NI	NI	NI	150	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
69 feet	NI	NI	NI	NS	400	NS	210	NS	NS	NS	160	160	NS	NS
87 feet	NI	NI	NI	110	320	NS	NS	NS	NS	NS	NS	NS	NS	NS
108.5 feet	NI	NI	NI	99	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
115 feet	NI	NI	NI	110	NS	NS	64	NS	NS	NS	5	6	3	NS
MW-6														
70 feet	NI	NI	NI	NS	37	NS	6	NS	NS	NS	3	4	NS	NS
70.5 feet	NI	NI	NI	42	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
88 feet	NI	NI	NI	44	54	NS	60	NS	NS	NS	5	4	3	NS
MW-7														
56 feet	NI	NI	NI	1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
57 feet	NI	NI	NI	NS	1	NS	1 U	NS	NS	NS	1 U	1 U	NS	NS
61 feet	NI	NI	NI	1 U	1	NS	1 U	NS	NS	NS	1 U	NS	NS	NS
66 feet	NI	NI	NI	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
79.5 feet	NI	NI	NI	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
93.5 feet	NI	NI	NI	1 U	1 U	NS	9	NS	NS	NS	9/9 (b)	12	6	NS
MW-8														
62.5 feet	NI	NI	NI	NS	29/26 (b)	NS	27	NS	NS	NS	5	NS	NS	NS
65 feet	NI	NI	NI	13	NS	NS	NS	NS	NS	NS	NS	7	1 U	NS
70 feet	NI	NI	NI	5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
83 feet	NI	NI	NI	3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
97.5 feet	NI	NI	NI	3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
100 feet	NI	NI	NI	NS	3	NS	4	NS	NS	NS	4	1 U		
MW-9														
72	NI	NI	NI	NI	NI	NI	1	NS	NS	NS	1	1	1 U	NS
83	NI	NI	NI	NI	NI	NI	1	NS	NS	NS	NS	NS	NS	NS
85	NI	NI	NI	NI	NI	NI	NS	NS	NS	NS	1	NS	NS	NS
106	NI	NI	NI	NI	NI	NI	1	NS	NS	NS	1	NS	NS	NS
115	NI	NI	NI	NI	NI	NI	1	NS	NS	NS	NS	1	1	NS
124.5	NI	NI	NI	NI	NI	NI	1	NS	NS	NS	NS	NS	NS	NS
MW-10														
95	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS	1 U	1 U	1 U	NS
120	NI	NI	NI	NI	NI	NI	1	NS	NS	NS	1 U	NS	1 U	NS
161	NI	NI	NI	NI	NI	NI	1	NS	NS	NS	NS	NS	NS	NS
182	NI	NI	NI	NI	NI	NI	1	NS	NS	NS	NS	1 U	NS	NS
247	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS	NS	NS	NS	NS
257	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS	NS	NS	NS	NS
280	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS	NS	1 U	NS	NS

Table 4

Quarterly Groundwater Sample Results for Trichloroethene (ug/l) (a)
November 2005 - March 2009
Brooks Instrument Facility
Hatfield, Pennsylvania

	Nov-05	Mar-06	Jun-06	Sep-06	Dec-06	Apr-07	Jun-07	Sep-07	Dec-07	Mar-08	Jun-08	Sep-08	Dec-08	Mar-09
MW-11														
67	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	1 U	1 U	1 U	NS
73.5	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS
87	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS
115	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS
120	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS	1 U	1 U	NS

a/ NS - not sampled, NI - not installed, D - sample was diluted, U - not detected,
E - preliminary result exceeds calibration range
b/ Duplicate samples
c/ Pump shut down
d/ Sample vials broken upon receipt at laboratory; no analysis performed.
e/ Well was grouted from bottom (325 feet) to 172 feet.
Note: Sample from MW-11 at 67 feet bgs - total dissolved solids = 405 mg/L
Results for November 2005 are from passive diffusive bag samplers; remaining samples were collected using low-flow sampling techniques

Table 5

Quarterly Groundwater Sample Results for Tetrachloroethene (ug/l)
November 2005 - April 2007
Brooks Instrument Facility
Hatfield, Pennsylvania

	Nov-05	Mar-06	Jun-06	Sep-06	Dec-06	Apr-07	Jun-07	Sep-07	Dec-07	Mar-08	Jun-08	Sep-08	Dec-08	Mar-09
MW-1														
59 feet	NS	6	NS	12	13	3	32	NS	NS	NS	NS	NS	NS	NS
70 feet	13	NS	7	7/8 (b)	7	10	NS	11	6/4 (b)	4/4 (b)	5	7	6	5
84 feet	14	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
98 feet	14	4	5	5	6	3	8	12	5	3	3	6	5	4
105.5 feet	13	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
112 feet	14	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-2														
Influent	NS (c)	NS (c)	NS (c)	NS (c)	18/18 (b)	14	16	19	(d)	15	16	18	18	16
62.5 feet	50	28	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
77.5 feet	31	24	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
86.5 feet	29	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
94.5 feet	30/28 (b)	19	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
101 feet	29/30 (b)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
114 feet	29	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
125.5 feet	31	16	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-3														
54.5 feet	NS	2	1 U	11	23	22	28	NS	NS	NS	NS	NS	NS	NS
60 feet	1.3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	12	7	7
85 feet	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
111 feet	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
131 feet	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
140 feet	1 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
146.5 feet	1 U	1 U	1 U	7	11	1	11	7/7 (b)	4	3	5	NS	4	2
160 feet	1 U	NS	1 U	NS	12	2	9	7	4	4	7	2	NS	1
178.5 feet	1 U	NS	1 U	NS (e)	NS (b)	NS (b)	NS (b)	NS (b)	NS (b)	NS (b)	NS (b)	NS (b)	NS (b)	NS (b)
198 feet	1 U	1 U	1 U	--	--	--	--	--	--	--	--	--	--	--
211 feet	1 U	NS	NS	--	--	--	--	--	--	--	--	--	--	--
227 feet	1 U	NS	NS	--	--	--	--	--	--	--	--	--	--	--
237.5 feet	1 U	1 U	1/1 (b)	--	--	--	--	--	--	--	--	--	--	--
262 feet	1 U	NS	NS	--	--	--	--	--	--	--	--	--	--	--
290 feet	1 U	NS	NS	--	--	--	--	--	--	--	--	--	--	--
302.5 feet	1 U	NS	NS	--	--	--	--	--	--	--	--	--	--	--
MW-4														
61 feet	NI	NI	NI	12/11 (b)	10/9 (b)	NS	NS	NS	NS	NS	NS	NS	1	NS
80.5 feet	NI	NI	NI	10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
82.5 feet	NI	NI	NI	NS	9	NS	1/1 (b)	NS	NS	NS	1 U	2	NS	NS
120.5 feet	NI	NI	NI	8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
123 feet	NI	NI	NI	NS	9	NS	3	NS	NS	NS	3	5/5 (b)	NS	NS

Table 5

Quarterly Groundwater Sample Results for Tetrachloroethene (ug/l)
November 2005 - April 2007
Brooks Instrument Facility
Hatfield, Pennsylvania

	Nov-05	Mar-06	Jun-06	Sep-06	Dec-06	Apr-07	Jun-07	Sep-07	Dec-07	Mar-08	Jun-08	Sep-08	Dec-08	Mar-09
MW-5														
58 feet	NI	NI	NI	43/43 (b)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
59 feet	NI	NI	NI	NS	55	NS	65	NS	NS	NS	38	52	31	NS
64 feet	NI	NI	NI	NS	53	NS	69/71 (b)	NS	NS	NS	40	NS	NS	NS
65 feet	NI	NI	NI	20	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
69 feet	NI	NI	NI	NS	42	NS	57	NS	NS	NS	24	38	NS	NS
87 feet	NI	NI	NI	4	36	NS	NS	NS	NS	NS	NS	NS	NS	NS
108.5 feet	NI	NI	NI	3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
115 feet	NI	NI	NI	3	NS	NS	4	NS	NS	NS	1 U	1 U	1 U	NS
MW-6														
70 feet	NI	NI	NI	NS	7	NS	1 U	NS	NS	NS	1 U	1 U	NS	NS
70.5 feet	NI	NI	NI	8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
88 feet	NI	NI	NI	8	8	NS	16	NS	NS	NS	1	1	1 U	NS
MW-7														
56 feet	NI	NI	NI	3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
57 feet	NI	NI	NI	NS	4	NS	2	NS	NS	NS	2	3	NS	NS
61 feet	NI	NI	NI	4	6	NS	3	NS	NS	NS	2	NS	NS	NS
66 feet	NI	NI	NI	8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
79.5 feet	NI	NI	NI	13	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
93.5 feet	NI	NI	NI	13	13	NS	3	NS	NS	NS	5/6 (b)	11	3	NS
MW-8														
62.5 feet	NI	NI	NI	NS	13/12 (b)	NS	5	NS	NS	NS	5	NS	NS	NS
65 feet	NI	NI	NI	7	NS	NS	NS	NS	NS	NS	NS	10	6	NS
70 feet	NI	NI	NI	6	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
83 feet	NI	NI	NI	6	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
97.5 feet	NI	NI	NI	6	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
100 feet	NI	NI	NI	NS	27	NS	12	NS	NS	NS	4	7	NS	NS
MW-9														
72	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS	1 U	1 U	1 U	NS
83	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS	NS	NS	NS	NS
85	NI	NI	NI	NI	NI	NI	NS	NS	NS	NS	1 U	NS	NS	NS
106	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS	1 U	NS	NS	NS
115	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS	NS	1 U	1 U	NS
124.5	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS	NS	NS	NS	NS

Table 5

Quarterly Groundwater Sample Results for Tetrachloroethene (ug/l)
November 2005 - April 2007
Brooks Instrument Facility
Hatfield, Pennsylvania

	Nov-05	Mar-06	Jun-06	Sep-06	Dec-06	Apr-07	Jun-07	Sep-07	Dec-07	Mar-08	Jun-08	Sep-08	Dec-08	Mar-09
MW-10														
95	NI	NI	NI	NI	NI	NI	2	NS	NS	NS	1	3	3	NS
120	NI	NI	NI	NI	NI	NI	3	NS	NS	NS	2	NS	2	NS
161	NI	NI	NI	NI	NI	NI	2	NS	NS	NS	NS	NS	NS	NS
182	NI	NI	NI	NI	NI	NI	2	NS	NS	NS	NS	2	NS	NS
247	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS	NS	NS	NS	NS
257	NI	NI	NI	NI	NI	NI	1	NS	NS	NS	NS	NS	NS	NS
280	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS	NS	1	NS	NS
MW-11														
67	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	1 U	1 U	1 U	NS
73.5	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS
87	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS
115	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	1 U	NS	NS	NS
120	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NS	1 U	1 U	NS

a/ NS - not sampled, NI - not installed, D - sample was diluted, U - not detected
E - preliminary result exceeds calibration range
e/ Well was grouted from bottom (325 feet) to 172 feet.
b/ Duplicate samples
c/ Pump shut down
d/ Sample vials broken upon receipt at laboratory; no analysis performed.

samples were collected using low-flow sampling techniques
Note: Sample from MW-11 at 67 feet bgs - total dissolved solids = 405 mg/L

Table 6

Groundwater Elevation Data
Brooks Instrument Site
Hatfield, Pennsylvania

			Groundwater Elevation (feet above mean sea level)													
Well ID	**Top of Casing Elevation (ft aMSL)**	**Total Depth (ft btoc)**	**9/22/2005** (b)	**2/27/2006** (b)	**3/2/2006** (b)	**4/11/2006**	**5/23/2006**	**8/28/2006** (c,d)	**9/22/2006** (c,d)	**10/25/2006** (c,d)	**11/2/2006** (c)	**1/17/2007** (c)	**2/18/2007** (c)	**3/15/2007** (c)	**4/4/2007** (c)	**5/15/2007**
MW-1	348.71	127.1	285.71	293.49	293.80	290.40	288.58	290.53	291.32	292.90	291.90	294.97	295.21	292.95	293.06	292.69
MW-2	345.29	NM	291.51	299.16	298.81	249.83	NM	295.67	296.81	298.25	261.31	(e)	(e)	(e)	(e)	250.21
MW-3	345.21	174.4	291.21	299.78	299.97	296.36	295.63	296.30	296.90	298.53	296.31	299.51	299.92	296.86	297.10	296.65
MW-4D	341.75	125.61	NI	NI	NI	NI	NI	299.82	300.91	302.41	300.13	303.25	303.57	300.52	299.88	300.50
MW-4S	341.65	87.94	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NM
MW-5D	346.81	121.7	NI	NI	NI	NI	NI	298.36	299.21	300.06	299.89	302.07	301.98	300.81	298.52	NM
MW-5S	346.8	77.80	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NM
MW-6D	344.18	95.17	NI	NI	NI	NI	NI	284.01	284.00	286.69	286.17	288.70	290.73	289.05	284.40	NM
MW-6S	344.17	75.41	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NM
MW-7D	339.07	94.88	NI	NI	NI	NI	NI	300.53	303.58	305.49	305.97	308.50	308.69	308.46	300.63	NM
MW-7S	339.08	65.65	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NM
MW-8D	348.69	105.22	NI	NI	NI	NI	NI	289.11	290.91	292.55	291.59	294.69	295.21	292.62	289.28	NM
MW-8S	348.75	70.28	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NM
MW-9	353.93	128.5	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NM
MW-10	350.48	298	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NM
MW-11	348.27	125	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI

a/ NI - not installed
NM - not measured
b/ Non-pumping conditions; pump shut down 9/2005 and re-started on 3/2/2006
c/ Wells MW-4 through MW-6 were open boreholes until June 2007
d/ Non-pumping conditions; pump shut down 8/2006 and re-started on 10/25/2006
e/ Well was pumping, no measurements collected

Table 6

Groundwater Elevation Data
Brooks Instrument Site
Hatfield, Pennsylvania

				Groundwater Elevation (feet above mean sea level)								
Well ID	**Top of Casing Elevation (ft aMSL)**	**Total Depth (ft btoc)**	(c)	**6/6/2007**	**6/18/2007**	**9/26/2007**	**12/20/2007**	**3/5/2008**	**6/5/2008**	**9/29/2008**	**12/15/2008**	**3/3/2009**
MW-1	348.71	127.1		293.07	292.46	285.90	285.06	288.51	289.31	286.51	287.23	289.00
MW-2	345.29	NM		(e)	(e)	(e)	(e)	(e)	(e)	(e)	(e)	(e)
MW-3	345.21	174.4		297.91	296.32	290.47	291.53	294.16	294.41	292.16	293.72	294.63
MW-4D	341.75	125.61		301.19	300.23	NM	296.35	NM	298.81	296.67	298.22	NM
MW-4S	341.65	87.94		301.20	300.22	NM	296.18	NM	298.81	296.63	298.16	NM
MW-5D	346.81	121.7		300.27	299.90	NM	296.29	NM	298.66	296.53	297.66	NM
MW-5S	346.8	77.80		300.29	300.21	NM	294.77	NM	298.17	295.69	296.20	NM
MW-6D	344.18	95.17		288.36	289.57	NM	276.98	NM	283.40	281.55	281.54	NM
MW-6S	344.17	75.41		287.70	289.60	NM	276.18	NM	283.81	282.97	281.22	NM
MW-7D	339.07	94.88		308.03	307.39	NM	301.71	NM	305.01	299.94	301.10	NM
MW-7S	339.08	65.65		309.43	309.24	NM	303.59	NM	306.98	302.79	304.98	NM
MW-8D	348.69	105.22		293.24	292.73	NM	285.08	NM	289.61	286.80	287.66	NM
MW-8S	348.75	70.28		293.07	292.82	NM	285.51	NM	289.31	286.53	287.13	NM
MW-9	353.93	128.5		293.51	293.27	NM	286.70	NM	291.12	288.21	288.38	NM
MW-10	350.48	298		259.31	257.70	NM	239.38	NM	254.29	257.59	284.68	NM
MW-11	348.27	125		NI	NI	NI	NI	NI	283.69	283.85	285.32	NM

a/ NI - not installed
NM - not measured
b/ Non-pumping conditions; pump shut
c/ Wells MW-4 through MW-6 were ope
d/ Non-pumping conditions; pump shut
e/ Well was pumping, no measurements

Table 7

Soil Sample Results
December 2008
Brooks Instrument Facility
Hatfield, PA

	PADEP MSC Soil Residential and Industrial Soil to Groundwater Used Aquifer	Sample Name:	SB-75	SB-76	SB-77	SB-78	SB-79	SB-80	SB-81	SB-82
		Date:	12/16/2008	12/16/2008	12/16/2008	12/16/2008	12/16/2008	12/16/2008	12/16/2008	12/16/2008
		Depth:	2-4 feet	2-4 feet	2-4 feet	4-6 feet	2-4 feet	4-6 feet	2-4 feet	2-4 feet
VOC (µg/kg)										
1,1-Dichloroethene	700		4 U	4 U	20	5 U	6 U	29 J	5 U	5 U
trans-1,2-Dichloroethene	10,000		4 U	4 U	23	5	6 U	28 J	5 U	5 U
cis-1,2-Dichloroethene	7,000		4 U	4 U	4,400	780	6 U	**10,000** J	5 J	14 J
Trichloroethene	500		4 U	4 U	**700** J	16 J	6 U	**35,000** J	5 U	5 U
Vinyl Chloride	200		4 U	4 U	**360**	150	6 U	160 J	5 U	18 J

a/ VOC - volatile organic compound
U - not detected
J - estimated concentration

Enclosure A

Boring Log: MW-9

Project: Brooks Instrument
Project No.: 131070
Location: Hatfield, PA
Completion Date: May 30, 2007

Surface Elevation (feet AMSL*): 354.33
Total Depth (feet): 130
Borehole Diameter (inches): 8

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
	1	0.0		100		***Silt (ML)*** Reddish-brown (2.5YR 5/3) silt; medium dense; moist.
	2	0.0		25		
20						***Silt with Gravel (ML)*** Reddish-brown (2.5YR 4/4) silt, little 0.5-inch diameter angular rock fragments, trace clay; very dense; dry.
						Siltstone Reddish-brown (2.5YR 4/3 to 2.5YR 4/4) siltstone, trace calcium carbonate at 17 feet.
40						***Siltstone*** Red (2.5YR 4/6) siltstone, slightly weathered between 49 and 54 feet.
60						
						Siltstone Dark reddish-brown (2.5YR 3/3) siltstone; wet between 97 and 130 feet.
80						
100						
120						
						Bottom of Boring at 130 feet
140						

Geologist(s): Erik S. Reinert
Subcontractor: Eichelbergers, Inc.
Driller/Operator: Terry Rowe
Method: Down-Hole Air Hammer

WSP Environmental Strategies
11911 Freedom Drive, Suite 900
Reston, VA 20190
703-709-6500

Boring Log: MW-10

Project: Brooks Instrument

Project No.: 131070

Location: Hatfield, PA

Completion Date: May 31, 2007

Surface Elevation (feet AMSL*): 351.01

Total Depth (feet): 300

Borehole Diameter (inches): 8

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
	1			50		***Silt (ML)*** Light red (2.5YR 6/6) silt, trace clay; very dense; dry. Split-spoon refusal at 3 feet.
						Siltstone Reddish-brown (2.5YR 4/4) siltstone, trace calcium carbonate at 17 feet.
20						***Siltstone*** Red (2.5YR 4/4) to weak red (10R5/4) siltstone; slightly weathered between 20 and 70 feet bgs, wet between 100 and 240 feet.
40						
60						
80						
100						

Geologist(s): Erik S. Reinert

Subcontractor: Eichelbergers, Inc.

Driller/Operator: Terry Rowe

Method: Down-Hole Air Hammer

WSP Environmental Strategies
11911 Freedom Drive, Suite 900
Reston, VA 20190
703-709-6500

Boring Log: MW-10

Project: Brooks Instrument

Project No.: 131070

Location: Hatfield, PA

Completion Date: May 31, 2007

Surface Elevation (feet AMSL*): 351.01

Total Depth (feet): 300

Borehole Diameter (inches): 8

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
120						***Siltstone*** Red (2.5YR 4/4) to weak red (10R5/4) siltstone; slightly weathered between 20 and 70 feet bgs, wet between 100 and 240 feet. *(continued)*
140						
160						
180						
200						

Geologist(s): Erik S. Reinert

Subcontractor: Eichelbergers, Inc.

Driller/Operator: Terry Rowe

Method: Down-Hole Air Hammer

WSP Environmental Strategies
11911 Freedom Drive, Suite 900
Reston, VA 20190
703-709-6500

Boring Log: MW-10

Project: Brooks Instrument

Project No.: 131070

Location: Hatfield, PA

Completion Date: May 31, 2007

Surface Elevation (feet AMSL*): 351.01

Total Depth (feet): 300

Borehole Diameter (inches): 8

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Siltstone Red (2.5YR 4/4) to weak red (10R5/4) siltstone; slightly weathered between 20 and 70 feet bgs, wet between 100 and 240 feet. *(continued)*
220						
240						***Shale*** Dark gray (GLEY 4/N) shale; laminated; unweathered; wet.
260						
280						***Siltstone*** Dark reddish-gray (2.5YR 4/1) siltstone; laminated; wet. ***Siltstone*** Dusky red (2.5YR 3/2) siltstone; wet.
300						

Bottom of Boring at 300 feet

Geologist(s): Erik S. Reinert

Subcontractor: Eichelbergers, Inc.

Driller/Operator: Terry Rowe

Method: Down-Hole Air Hammer

WSP Environmental Strategies
11911 Freedom Drive, Suite 900
Reston, VA 20190
703-709-6500

Boring Log: MW-11

Project: Brooks Instrument

Project No.: 131070

Location: Hatfield, PA

Completion Date: May 28, 2008

Surface Elevation (feet AMSL*): 348.93

Total Depth (feet): 125

Borehole Diameter (inches): 8

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
		0.0		50		
		0.0		50		
						Lean Clay (CL) Strong brown (7.5YR 5/6) to yellowish red (5YR 4/6) medium plasticity clay; medium dense; moist, gray mottling. Split spoon refusal at 4ft bgs.
20						***Siltstone*** Dark Red (10R 3/6) siltstone; color becoming gray at 68ft bgs; slightly weathered from 68ft to 80ft bgs and again at 88ft bgs; moist at 6ft bgs. Driller' notes included intervals of fast drilling, indicating possible fracture zones, at 38ft, 42ft, 50ft, 74ft, 83ft, and 88ft bgs.
40						
60						
80						
100						
120						

Bottom of Boring at 125 feet

Geologist(s): Steve D. Dawson

Subcontractor: Eichelbergers, Inc.

Driller/Operator: Mark Billus

Method: Down-Hole Air Hammer

WSP Environmental Strategies
11911 Freedom Drive, Suite 900
Reston, VA 20190
703-709-6500

Boring Log: SB-75A

Project: Brooks Instrument

Project No.: 131070

Location: Hatfield, PA

Completion Date: December 16, 2008

Surface Elevation (feet AMSL*): Not Determined

Total Depth (feet): 5

Borehole Diameter (inches): 2.25

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
						Asphalt
						Silt with Gravel (ML) Dark reddish-brown (2.5YR 3/4) silt, little angular siltstone gravel; dense; moist.
2	1	(0-2) 0.0 (2-4) 1.3 (4-5) 0.0	- - - -	100		***Gravelly Silt (ML)*** Dark reddish-brown (2.5YR 3/4) silt, some angular siltstone gravel; very dense; dry. [Weathered Bedrock]
4						
6						Bottom of Boring at 5 feet Refusal at bedrock interface Location data are approximate (not surveyed).
8						
10						
12						
14						

Geologist(s): Erik S. Reinert

Subcontractor: Eichelbergers, Inc.

Driller/Operator: Paul Wirrick

Method: Direct Push

WSP Environment & Energy
5 Sullivan Street
Cazenovia, New York 13035
315-655-3900

Boring Log: SB-76A

Project: Brooks Instrument

Project No.: 131070

Location: Hatfield, PA

Completion Date: December 16, 2008

Surface Elevation (feet AMSL*): Not Determined

Total Depth (feet): 3.5

Borehole Diameter (inches): 2.25

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
						Asphalt
2	1	(0-2) 2.5 (2-4) 2.2	- - - -	100		***Silt with Gravel (ML)*** Reddish-brown (2.5YR 3/4) silt, little angular siltstone gravel; dense; moist.
4						Bottom of Boring at 3.5 feet Refusal at bedrock interface Location data are approximate (not surveyed).
6						
8						
10						
12						
14						

Geologist(s): Erik S. Reinert

Subcontractor: Eichelbergers, Inc.

Driller/Operator: Paul Wirrick

Method: Direct Push

WSP Environment & Energy
5 Sullivan Street
Cazenovia, New York 13035
315-655-3900

Boring Log: SB-77

Project: Brooks Instrument

Project No.: 131070

Location: Hatfield, PA

Completion Date: December 16, 2008

Surface Elevation (feet AMSL*): Not Determined

Total Depth (feet): 8

Borehole Diameter (inches): 2.25

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	1	166	- - - -	10		***Asphalt***
4						***Silt with Gravel (ML)*** Reddish-brown (2.5YR 3/4) silt, little angular siltstone gravel; dense; moist.
6	2	318	- - - -	27		***Silt with Gravel (ML)*** Reddish-brown (2.5YR 4/3) silt, little angular siltstone gravel, little clay; wet.
8						Bottom of Boring at 8 feet Refusal at bedrock interface Location data are approximate (not surveyed).
10						
12						
14						

Geologist(s): Erik S. Reinert

Subcontractor: Eichelbergers, Inc.

Driller/Operator: Paul Wirrick

Method: Direct Push

WSP Environment & Energy
5 Sullivan Street
Cazenovia, New York 13035
315-655-3900

Boring Log: SB-78

Project: Brooks Instrument
Project No.: 131070
Location: Hatfield, PA
Completion Date: December 16, 2008

Surface Elevation (feet AMSL*): Not Determir
Total Depth (feet): 7
Borehole Diameter (inches): 2.25

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
						No recovery.
2	1	(0-3) 1.7 (3-5) 15.7	- - - -	60		***Poorly-Graded Gravel with Sand (GP)*** Reddish-black (2.5YR 2.5/1) gravel, some fine to coarse-grained sand, trace silt; loose; dry.
4						***Silty Gravel (GM)*** Very dusky red (2.5YR 2.5/2) gravel, little silt, trace to little fine to coarse-grained sand; loose; dry.
6	2	3.2	- - - -	100		***Silt (ML)*** Red (2.5YR 4/6) silt; very dense; dry. ***Poorly-Graded Gravel (GP)*** Dark reddish-gray (2.5YR 3/1) angular gravel; loose; wet.
8						***Gravelly Silt (ML)*** Dark reddish-brown (2.5YR 3/4) silt, some angular siltstone gravel; dense; moist. ***Poorly-Graded Gravel with Silt (GP-GM)*** Dark reddish-brown (2.5YR 3/4) angular siltstone gravel, trace to little silt; dense; wet. [Weathered Bedrock]
10						Bottom of Boring at 7 feet Refusal at bedrock interface Location data are approximate (not surveyed).
12						
14						

Geologist(s): Erik S. Reinert
Subcontractor: Eichelbergers, Inc.
Driller/Operator: Paul Wirrick
Method: Direct Push

WSP Environment & Energy
5 Sullivan Street
Cazenovia, New York 13035
315-655-3900

Boring Log: SB-79

Project: Brooks Instrument

Project No.: 131070

Location: Hatfield, PA

Completion Date: December 16, 2008

Surface Elevation (feet AMSL*): Not Determined

Total Depth (feet): 5

Borehole Diameter (inches): 2.25

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
						Asphalt
2	1	(0-2) 0.6 (2-4) 0.7 (4-5) 0.3	- - - -	100		***Silt with Gravel (ML)*** Reddish-brown (2.5YR 4/4) silt, little clay, little angular gravel; dense; dry.
						Poorly-Graded Gravel with Silt (GP-GM) Dark reddish-brown (2.5YR 3/3) angular siltstone gravel, little silt; dense; dry.
4						***Gravelly Silt (ML)*** Very dusky red (2.5YR 2.5/2) silt, some angular siltstone fragments; dense; dry.
6						***Silt (ML)*** Yellow (10YR 7/8) very pale brown (10YR 7/3) and reddish-brown (5YR 4/3) silt, little clay; dense; dry, mottled.
						Silt (ML) Dark reddish-brown (2.5YR 3/3) silt, little clay; dense; dry.
8						Bottom of Boring at 5 feet Refusal at bedrock interface Location data are approximate (not surveyed).
10						
12						
14						

Geologist(s): Erik S. Reinert

Subcontractor: Eichelbergers, Inc.

Driller/Operator: Paul Wirrick

Method: Direct Push

WSP Environment & Energy
5 Sullivan Street
Cazenovia, New York 13035
315-655-3900

Boring Log: SB-80

Project: Brooks Instrument

Project No.: 131070

Location: Hatfield, PA

Completion Date: December 16, 2008

Surface Elevation (feet AMSL*): Not Determined

Total Depth (feet): 7.5

Borehole Diameter (inches): 2.25

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	1	101	- - - -	16		No recovery.
4						***Gravelly Silt (ML)*** Dark reddish-brown (2.5YR 3/4) silt, some angular gravel; dense; dry.
6	2	95.1	- - - -	100		***Lean Clay (CL)*** Reddish-brown (2.5YR 4/3) clay; soft; wet.
8						Bottom of Boring at 7.5 feet Refusal at bedrock interface Location data are approximate (not surveyed).
10						
12						
14						

Geologist(s): Erik S. Reinert

Subcontractor: Eichelbergers, Inc.

Driller/Operator: Paul Wirrick

Method: Direct Push

WSP Environment & Energy
5 Sullivan Street
Cazenovia, New York 13035
315-655-3900

Boring Log: SB-81

Project: Brooks Instrument

Project No.: 131070

Location: Hatfield, PA

Completion Date: December 16, 2008

Surface Elevation (feet AMSL*): Not Determined

Total Depth (feet): 5

Borehole Diameter (inches): 2.25

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
2	1	(0-2) 0.1 (2-4) 0.7 (4-5) 0.0	- - - -	100		***Asphalt***
4						***Gravelly Silt (ML)*** Dark reddish-brown (2.5YR 3/4) silt, some angular siltstone fragments; dense; dry.
6						Bottom of Boring at 5 feet Refusal at bedrock interface Location data are approximate (not surveyed).
8						
10						
12						
14						

Geologist(s): Erik S. Reinert

Subcontractor: Eichelbergers, Inc.

Driller/Operator: Paul Wirrick

Method: Direct Push

WSP Environment & Energy
5 Sullivan Street
Cazenovia, New York 13035
315-655-3900

Boring Log: SB-82

Project: Brooks Instrument

Project No.: 131070

Location: Hatfield, PA

Completion Date: December 16, 2008

Surface Elevation (feet AMSL*): Not Determined

Total Depth (feet): 5

Borehole Diameter (inches): 2.25

*AMSL = Above mean sea level

Sample Data					Subsurface Profile	
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description
						Ground Surface
						Asphalt
2	1	(0-2) 0.3 (2-4) 0.7 (4-5) 2.2	- - - -	100		***Silt with Gravel (ML)*** Reddish-brown (10YR 4/3) silt, little gravel; dense; dry.
4						***Poorly-Graded Gravel (GP)*** Dark reddish-brown (2.5YR 3/4) siltstone fragments; loose; dry.
6						Bottom of Boring at 5 feet Refusal at bedrock interface Location data are approximate (not surveyed).
8						
10						
12						
14						

Geologist(s): Erik S. Reinert

Subcontractor: Eichelbergers, Inc.

Driller/Operator: Paul Wirrick

Method: Direct Push

WSP Environment & Energy
5 Sullivan Street
Cazenovia, New York 13035
315-655-3900

Enclosure B

Table 1

Soil Sample Results
2004-2007
Brooks Instrument Facility
Hatfield, Pennsylvania

Sample ID:	PADEP MSC Soil Resid. Soil-to-GW Used Aquifer TDS	SB-1	SB-1	SB-2	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10
Sample Type:		**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**
Sampling Date:		**10/26/2004**	**10/26/2004**	**10/26/2004**	**10/26/2004**	**10/26/2004**	**10/26/2004**	**10/26/2004**	**10/26/2004**	**10/26/2004**	**10/27/2004**	**10/27/2004**	**10/27/2004**
Depth:		**11-12 ft**	**15-16 ft**	**7-8 ft**	**9-10 ft**	**6-7 ft**	**9-10 ft**	**6-7 ft**	**8-9 ft**	**10.5-11.5 ft**	**6-7 ft**	**9-10 ft**	**11-12 ft**
VOCs (µg/Kg)													
1,1,1-Trichloroethane	20,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	No Standard	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	160
Acetone	370,000	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	92
cis-1,2-Dichloroethylene	7,000	14	5 U	33	20	5 U	5 U	5 U	5 U	5 U	43	5 U	6
Ethylbenzene	70,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	140
Methyl isobutyl ketone (MIBK)	19,000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	19
Methylcyclohexane	No Standard	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	6
Methylene chloride	500	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Naphthalene	10,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	500	5 U	5 U	12	7	5 U	5 U	5 U	16	5 U	11	7	300
Toluene	100,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	48
Trichloroethene	500	8	5 U	1,100 E	730 E	5 U	5	5 U	13	19	48	5 U	1,400 E
1,1,2-Trichlorotrifluoroethane	No Standard	5 U	5 U	85	97	5 U	5 U	5 U	5 U	5 U	5 U	5 U	130
m/p-xylene	No Standard	10 U	10 U	10 U	10 U	10 U	10 U	10 U	8 J	10 U	10 U	10 U	250
o-Xylene	No Standard	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	74

a/ U - not detected
NA - not analyzed
E - concentration exceeded calibration of instrument.
J - estimated concentration

Table 1

Soil Sample Results
2004-2007
Brooks Instrument Facility
Hatfield, Pennsylvania

Sample ID:	PADEP MSC Soil Resid. Soil-to-GW Used Aquifer TDS	SB-10	SB-11	SB-12	SB-13	SB-14	SB-15	SB-15	SB-16	SB-16	SB-17	SB-18	SB-19	SB-21
Sample Type:		**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**
Sampling Date:		**10/27/2004**	**10/27/2004**	**10/27/2004**	**02/28/06**	**02/28/06**	**02/28/06**	**02/28/06**	**02/28/06**	**02/28/06**	**02/28/06**	**02/28/06**	**02/28/06**	**02/28/06**
Depth:		**11-12 ft**	**8.5-9.5 ft**	**9-10 ft**	**8-10**	**8-10**	**6-8**	**8-10**	**2-4**	**6-8**	**8-9**	**8-10**	**8-9**	**5-6**
VOCs (µg/Kg)														
1,1,1-Trichloroethane	20,000	240	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	No Standard	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	370,000	400	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
cis-1,2-Dichloroethylene	7,000	45	5 U	22	20	67	8	30	21	40	75	25	13	27
Ethylbenzene	70,000	20,000 E	5 U	5 U	2	5	6 U	5 U	5 U	3	5 U	4 U	5 U	4 U
Methyl isobutyl ketone (MIBK)	19,000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	No Standard	1,100 E	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylene chloride	500	5 U	5 U	5 U	5 U	270	13	5 U	5 U	21	5 U	4 U	5 U	4 U
Naphthalene	10,000	56	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	500	14,000 E	5 U	62	6	44	64	54	310	80	28	3	10	19
Toluene	100,000	6,600 E	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	500	27,000 E	5 U	280	44	310	1,400	2,600	4,100	6,500	190	33	630	200
1,1,2-Trichlorotrifluoroethane	No Standard	16,000 E	5 U	46	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
m/p-xylene	No Standard	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
o-Xylene	No Standard	5 U	5 U	5 U	2	11	6 U	2	5 U	3	3	4 U	5 U	4 U

a/ U - not detected
NA - not analyzed
E - concentration exceeded calibration of instrumer
J - estimated concentration

Table 1

Soil Sample Results
2004-2007
Brooks Instrument Facility
Hatfield, Pennsylvania

Sample ID:	PADEP MSC Soil Resid. Soil-to-GW Used Aquifer TDS	SB-22	SB-23	SB-24	SB-25	SB-26	SB-27	SB-28	SB-29	SB-29	SB-30	SB-33	SB-36	SB-36
Sample Type:		INVE	INVE	INVE	INVE	INVE	INVE	INVE	INVE	INVE	INVE	INVE	INVE	INVE
Sampling Date:		02/28/06	03/01/06	03/01/06	03/01/06	03/01/06	03/01/06	03/01/06	03/01/06	03/01/06	03/01/06	11/16/06	11/16/06	11/16/06
Depth:		4-6	6-7	5-6	5-6	6-7	5-6	6-7	3-4	10-11	6-7	2-4	2-4	4-6
VOCs (µg/Kg)														
1,1,1-Trichloroethane	20,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
2-Hexanone	No Standard	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA
Acetone	370,000	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	NA	NA
cis-1,2-Dichloroethylene	7,000	7	13	9	18	3	5 U	3	15	73	5 U	NA	NA	NA
Ethylbenzene	70,000	5 U	6 U	6 U	5 U	5 U	5 U	5 U	5 U	6 U	5 U	NA	NA	NA
Methyl isobutyl ketone (MIBK)	19,000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA
Methylcyclohexane	No Standard	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
Methylene chloride	500	5 U	36	41	120	26	770	200	35	580	36	NA	NA	NA
Naphthalene	10,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
Tetrachloroethene	500	3	12	6 U	4	3	3	9	8	25	5 U	5 U	4 U	5 U
Toluene	100,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
Trichloroethene	500	65	190	20	47	69	16	150	190	380	4	21	75	150
1,1,2-Trichlorotrifluoroethane	No Standard	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
m/p-xylene	No Standard	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA
o-Xylene	No Standard	5 U	6 U	6 U	5 U	5 U	5 U	5 U	5 U	6 U	5 U	NA	NA	NA

a/ U - not detected
NA - not analyzed
E - concentration exceeded calibration of instrumer
J - estimated concentration

Table 1

Soil Sample Results
2004-2007
Brooks Instrument Facility
Hatfield, Pennsylvania

Sample ID:	PADEP MSC Soil Resid. Soil-to-GW Used Aquifer TDS	SB-38	SB-38	SB-39	SB-40	SB-42	SB-42	SB-44	SB-47	SB-49	SB-49	SB-52	SB-54	SB-55	SB-55	SB-59	SB-60
Sample Type:		**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**DUP**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**
Sampling Date:		**11/16/06**	**11/16/06**	**11/16/06**	**11/17/06**	**11/17/06**	**11/17/06**	**11/15/06**	**11/15/06**	**11/14/06**	**11/14/06**	**11/15/06**	**11/15/06**	**11/15/06**	**11/15/06**	**11/15/06**	**2/7/2007**
Depth:		**0-2**	**2-4**	**4-6**	**6-8**	**4-6**	**6-8**	**6-8**	**6-8**	**7-9**	**7-9**	**6-8**	**8-10**	**4-6**	**8-10**	**6-8**	**8-9**
VOCs (µg/Kg)																	
1,1,1-Trichloroethane	20,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	No Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	370,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethylene	7,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	70,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl isobutyl ketone (MIBK)	19,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	No Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	10,000	NA	NA U	NA U	NA	NA	NA U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	500	240	57	4 U	2	110	7	6 U	3	5 U	4	19	28	46	290	3	130
Toluene	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	500	40,000	12,000	6	6	8	3	48	43	3	9	3	26	320	1,200	12	870
1,1,2-Trichlorotrifluoroethane	No Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m/p-xylene	No Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	No Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

a/ U - not detected
NA - not analyzed
E - concentration exceeded calibration of instrumer
J - estimated concentration

Table 1

Soil Sample Results
2004-2007
Brooks Instrument Facility
Hatfield, Pennsylvania

Sample ID:	PADEP MSC Soil Resid. Soil-to-GW Used Aquifer TDS	SB-61	SB-62	SB-63	SB-64	SB-65	SB-66	SB-67	SB-68	SB-72	SB-74	SB-75	SB-76
Sample Type:		**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**	**INVE**
Sampling Date:		**2/7/2007**	**2/7/2007**	**2/7/2007**	**2/7/2007**	**2/7/2007**	**2/7/2007**	**2/7/2007**	**2/7/2007**	**2/7/2007**	**2/7/2007**	**2/7/2007**	**2/7/2007**
Depth:		**9-10**	**9.5-10.5**	**7-8**	**6.5-7.5**	**3-4**	**4-5**	**4.5-5.5**	**6-7**	**7-8**	**7-8**	**8-9**	**5.5-6.5**
VOCs (µg/Kg)													
1,1,1-Trichloroethane	20,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	No Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	370,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethylene	7,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	70,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl isobutyl ketone (MIBK)	19,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	No Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	500	170	170	6 U	6 U	5 U	6 U	5 U	5 U	6	6 U	5 U	8
Toluene	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	500	710	910	6 U	17	5 U	41	210	140	59	6 U	10	210
1,1,2-Trichlorotrifluoroethane	No Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m/p-xylene	No Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	No Standard	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

a/ U - not detected
NA - not analyzed
E - concentration exceeded calibration of instrumer
J - estimated concentration

13107031.DWG

Legend

- Storm Drain
- Monitoring Well
- Soil Boring (October 2004)
- Soil Boring (February/March 2006)
- Soil Boring (November 2006)
- Soil Boring (February 2007)
- Sump Sediment Sample
- Former Large Solvent Degreaser Location
- Former Small Vapor Degreaser Location
- Floor Drain Location
- Sewer Line

Residential Area

MW-4

MW-7

SB-73

Retention Pond

SB-72 SB-74

SB-15 SB-18 SB-19 SB-20 SB-17 SB-16 SB-14 SB-21 SB-13 SB-75 SB-76 MW-2 SB-23 SB-26 SB-22 SB-42 Garage SB-24 MW-3 SB-27 SB-25 SB-40 SB-41 SB-30 SB-29 SB-28

Picnic Pavilion

SB-47 SB-39 SB-8 SB-64 SB-66 SB-69 SB-59 SB-12 SB-63 SB-1 SB-38 SB-67 SB-70 SB-60 SB-7 SB-65 SB-68 SB-71 SB-54 SB-61 SB-53 SB-10 SB-55 SB-45 SB-37 SB-11 MW-8 SB-44 SB-2 SB-46 SB-52 SB-6 SB-9 SB-62 SB-43 SB-58 SB-36 SB-57 SB-51 SB-5 SB-3 SB-35 SB-49 SB-56 SB-50 SB-48 SB-4 MW-1

Residential Area

Grass

MW-6

Calibration Room

SB-31 SB-32 SB-34 SB-33

Parking

MW-5

West Vine Street

Residential Area

Residential Area

0 100

Scale in Feet

Figure 1
Site Layout with Monitoring Wells and Soil Boring Locations
Brooks Instrument Facility
Hatfield, Pennsylvania

WSP Environment & Energy
11190 Sunrise Valley Drive Suite 300
Reston, Virginia 20191
(703) 709-6500